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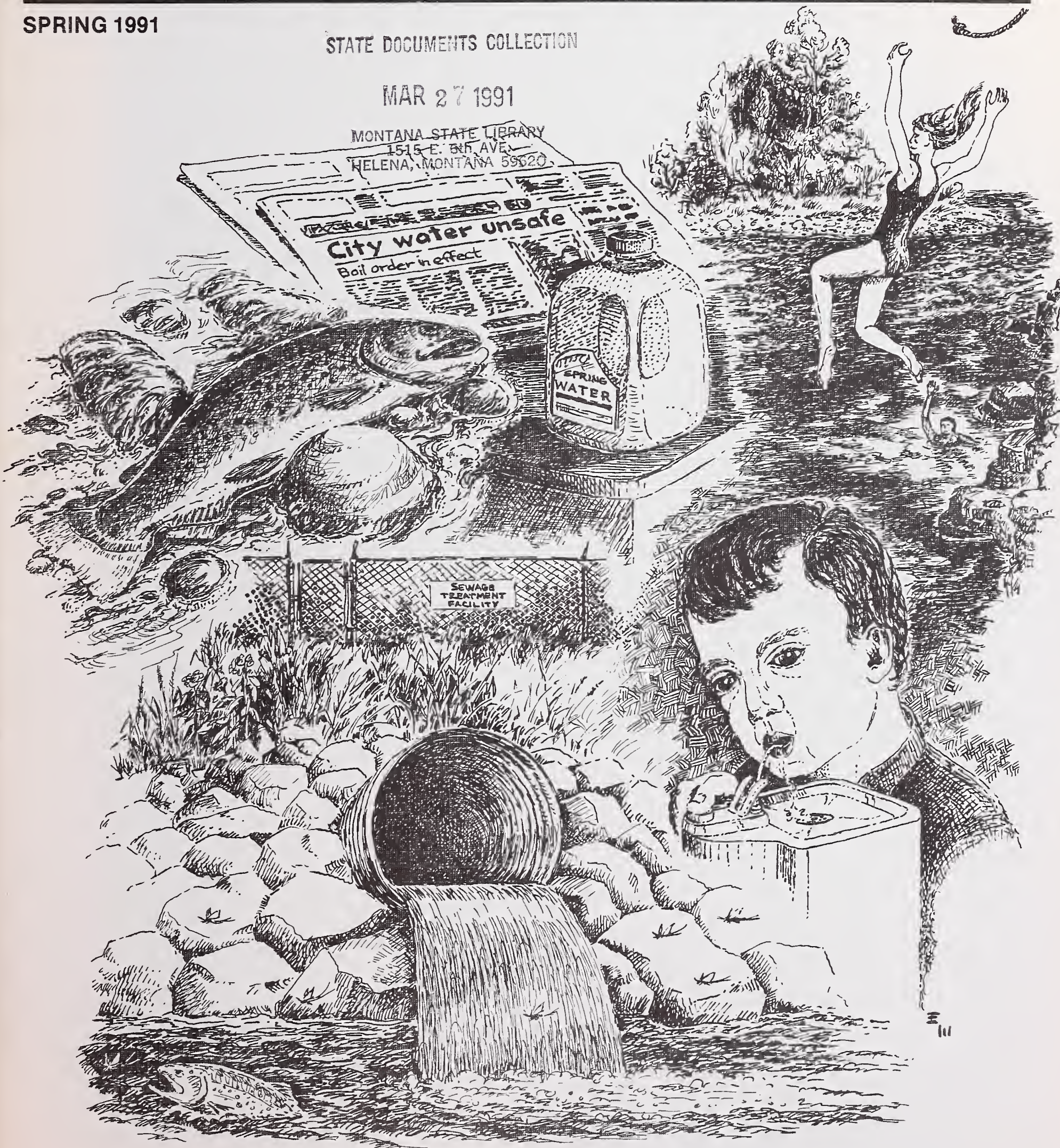
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~ OPERATOR CONTRIBUTIONS ~

Dave Aune
Water Quality Bureau

In a world so used to modern conveniences, the delivery of tap water or the flush of a toilet seem to be no great accomplishment. Water comes in, water goes out. We all assume the water coming in is safe and the wastewater exiting is properly treated. We never give it a second thought.

So is the plight of the water and wastewater operator. The contributions to our society by these dedicated professionals and the significant responsibilities they bear often go unnoticed. We, as a society, never give them a second thought. We don't fully understand or appreciate how reliant we are on the safe, efficient and reliable operation of public water and wastewater facilities.

But what happens if these systems fail or the operator makes a mistake? The consequences can be devastating. An operator acts to prevent water treatment mistakes that can result in waterborne disease outbreaks and numerous sicknesses or even deaths. The operator corrects cross-connections that could result in toxic poisoning or significant property damage. The wastewater operator prevents water pollution that may threaten a public water supply or a nearby swimming area. By preventing these things from happening, proper operation also minimizes the risk of law suits against a community.

In addition, proper operation and maintenance increases the service life of system equipment and facilities, which reduces capital costs. Good operation and maintenance can also improve system efficiency and reliability, thereby

reducing annual costs and enhancing customer confidence. The operator can also head off major failures by tracking system performance and predicting when portions of the system must be replaced. This helps communities prepare for system improvements, increases system reliability, and reduces the cost of system improvements.

Clearly, the contributions of the water and wastewater operator are many. They include the protection of public health and safety, prevention of environmental and property damage, reduction of local taxes, increased system reliability and service, and the overall enhancement of the quality of life within the community. The significant responsibility that operators bear and their contributions to our society deserve our respect and support.

Further, the operator needs to fully understand that his and her responsibilities, the public's expectations, and the potential impact proper operation has on quality of life, demand that he or she be conscientious and competent in the performance of his or her duties. The operator must be vigilant of the impact of his or her actions on the public. In addition, these responsibilities and the operators knowledge of the system require that he or she be involved in decisions that effect the performance of the system. The operator should also seek to inform the public and decision makers as to the condition and needs of the system.

Be proud and enthusiastic in what you do!

MONTANA MOBILIZES FOR SAFE DRINKING WATER

*By Gary Wiens
Water Quality Bureau*

EPA's Office of Drinking Water and the Water Quality Bureau are mobilizing to build strong partnerships between the state drinking water program and others involved in delivering safe drinking water to Montanans. The mobilization objectives are:

- o Strengthen support for the state drinking water program and for small water systems.
- o Encourage appropriate technology for small systems and provide training for operators, local health officials and others.
- o Change public attitudes to support safe drinking water programs.

The objectives of mobilizations are being accomplished through six initiatives:

<u>INITIATIVE</u>	<u>TARGET</u>	<u>GOAL</u>
State capacity	State decision makers	Strong state program with primacy
Local health officials	County health officials	Support and action by local health officials
Institutional support	Systems serving <3300 and state programs	Viable compliant small systems and state framework for small water system support
Non-transient non-community systems	Non-transient non-community systems	Awareness and compliance
Technology and training support	Engineering and technical community	Awareness and use of appropriate technology. Develop and deliver high priority training.
Public education	General public	Informed and supportive public

Any questions regarding mobilization may be directed to Montana's mobilization leader, Gary Wiens, Water Quality Bureau, Cogswell Building, Helena, MT 59620 or call 444-4626.

MONTANA

Public Water Supply TASK FORCE

EXECUTIVE SUMMARY

Montana's Public Water Supply Program faces a crisis. The program is not as effective as it should be because of inadequate funding and a shortage of staff. As a result, the state is unable to enforce drinking water standards or properly monitor water systems. Consumers are therefore at greater risk of drinking water that may be contaminated. Without adequate funding for the Public Water Supply Program, drinking water problems will likely increase.

The program's primary enforcement authority (primacy) over the federal Safe Drinking Water Act (SDWA) may be lost if new regulations are not enforced by the state. Without additional funding and staff, the Public Water Supply Program can not handle the additional requirements. Loss of primacy would eliminate federal funding assistance and return enforcement authority to the U.S. Environmental Protection Agency (EPA).

In the spring of 1990, the Governor's Office and the Department of Health and Environmental Sciences (DHES) appointed a Task Force to develop policies for the Public Water Supply Program. The Task Force consisted of 30 individuals from utilities, local health departments, state agencies, organizations working with water systems, and the general public. This executive summary explains the problems facing the Public Water Supply Program and details the Task Force's conclusions and recommendations.



Current Public Water Supply Program

The DHES's Water Quality Bureau is responsible for administration of Montana's Public Water Supply Program. The program is managed by the bureau's Public Water Supply Section, which also includes the Operator Certification and Subdivision programs. The program currently employs 12.5 full-time equivalents (FTE's) and contracts for an additional FTE for water system inspections.

Since 1977 the Public Water Supply Program has held primary enforcement authority (primacy) over the federal Safe Drinking Water Act. Recently, however, inadequate funding and staff shortages have prevented proper enforcement of drinking water requirements. In addition to jeopardizing public health, this has placed Montana at risk of losing primacy to the federal government.

To adequately enforce the drinking water regulations, excluding the Operator Certification and Subdivision programs, 18.5 FTE's are needed. This would require hiring an additional 5 FTE's for the Public Water Supply Program. Although these new positions have been approved by the administration, funds have not been available to fund them.

1986 Amendments to the Federal Safe Drinking Water Act

In 1986 Congress passed significant amendments to the original Safe Drinking Water Act in response to public concern over inadequacies of the original act and health risks of drinking water. These amendments tightened drinking water standards, mandated strict regulatory deadlines, and accelerated enforcement activities.

The 1986 SDWA Amendments required EPA to create new regulatory packages in the following areas:

- o Volatile organic chemicals
- o Microbiological organisms
- o Inorganic chemicals
- o Radionuclides
- o Pesticides and herbicides
- o Disinfection by-products
- o Treatment of surface-water systems
- o Disinfection of all groundwater supplies

Also addressed by the amendments are a ban on lead materials in water systems, development of state wellhead protection programs, and a detailed public notification program to inform water users of contamination and compliance problems.

Almost all of Montana's 2,400 public water systems will be affected by these amendments. However, small water facilities (comprising over 96% of Montana's systems) will have the most difficulty in meeting the new requirements. Their limited resources and narrow tax base can not readily handle the technical and financial impacts of the regulations.

In order to completely meet the new regulations, Montana's Public Water Supply Section is estimated to need 59.25 FTE's (1.8 for Operator Certification; 5.55 for Subdivisions; and the remaining 51.9 for the Public Water Supply Program). These needs are comparable to those of other states' drinking water agencies preparing to meet the 1986 SDWA amendments.

Loss of State Primacy

If Montana loses primacy, the EPA will become the primary enforcement authority over public water supplies in the state. EPA enforcement action will occur only after health standards are exceeded or systems are in violation of the SDWA. The EPA's approach to Montana's public water supplies will be strictly regulatory, not preventative.

Loss of state primacy will also result in a loss of federal funding assistance which is essential to Montana's drinking water programs. These programs include operator training, public education, technical assistance, responses to contamination, and investigations of waterborne diseases. The Subdivision and Operator Certification programs would also suffer because of their reliance on the Public Water Supply Program for staff and funds.

Continuing to fund existing state drinking water programs without primacy would cost Montana an additional \$1.18 million over existing state support. Elimination of the Public Water Supply Program with retention of only the Subdivision and Operator Certification programs would still require an additional \$339,184 over the present budgets of these programs. Clearly, Montana will face a greater financial burden if federal funding assistance to its drinking water programs is lost.

Task Force Conclusions and Recommendations

After carefully reviewing the problems facing Montana's Public Water Supply Program, the Task Force developed the following conclusions and recommendations.

Conclusions

- o Montana's Public Water Supply Program should retain existing regulatory and technical assistance functions.
- o Montana's Public Water Supply Program must be expanded to include requirements of the amended Safe Drinking Water Act and state primacy must be retained.
- o Legislative changes must be made to authorize the DHES to assess fees to supplement funding of the Public Water Supply Program.

Recommendations

- o Montana must provide a comprehensive Public Water Supply Program including preventive and enforcement activities.
- o The Public Water Supply Section should be staffed and funded to support the interim program shown in Figures 1 and 2.
- o The Sanitation in Subdivisions Act, MCA 76-4-105, should be amended to increase fees to support an additional 1.0 FTE.
- o The Public Water Supply Act should be amended to authorize the Department of Health and Environmental Sciences to assess fees for services to alleviate the Public Water Supply Program funding shortfall. Funds raised through fees should be used to supplement existing funding of the Public Water Supply Program.*
- o The Task Force should reconvene to reassess the status of the Public Water Supply Section and make recommendations for the 1993 Legislative Session.

**Fees should be generated as engineering plan review fees and service connection fees. Total cost for the program would not exceed the equivalent of a \$3 annual fee on each public water supply service connection. Very small water systems (those with less than 33 connections) may be assessed a minimum annual fee of \$100 to reflect their program support more equitably.*

It is important to note that any new fee assessments or increases in existing fee schedules would be determined through the rule-making process. This guarantees the public opportunity to review and comment on the proposed fee changes needed to support the Public Water Supply Program.

Local units of government would receive the fees for services they provide, less costs of collection by DHES.

Figure 1 indicates staffing needs and duties for the interim program.

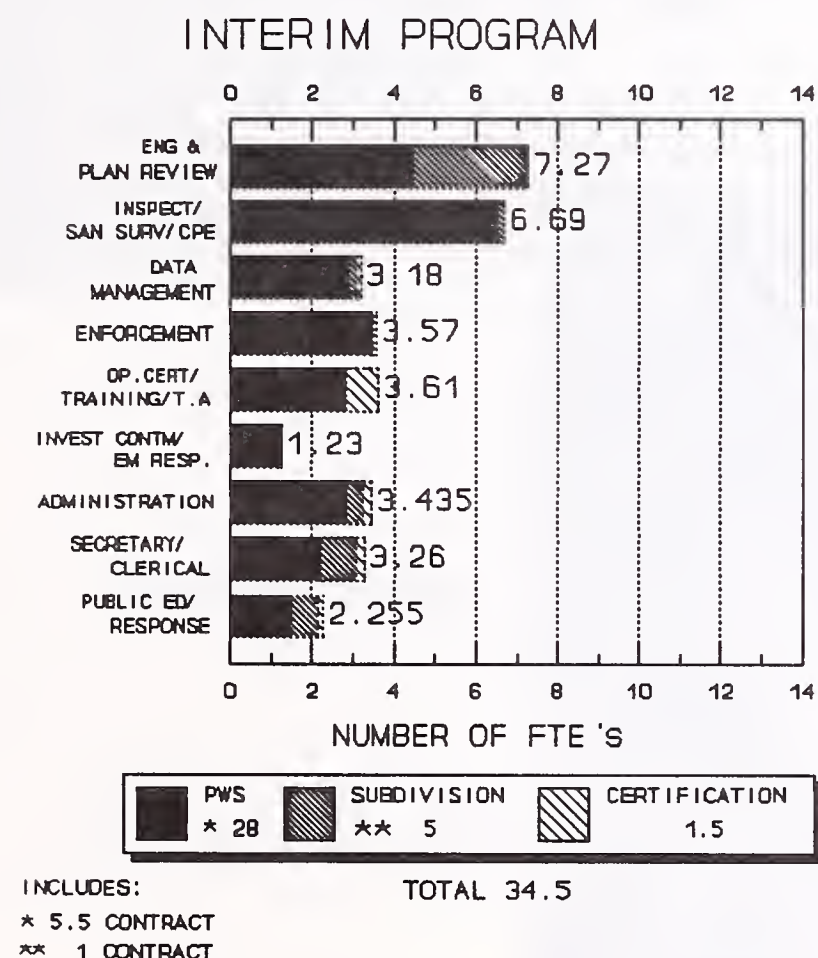
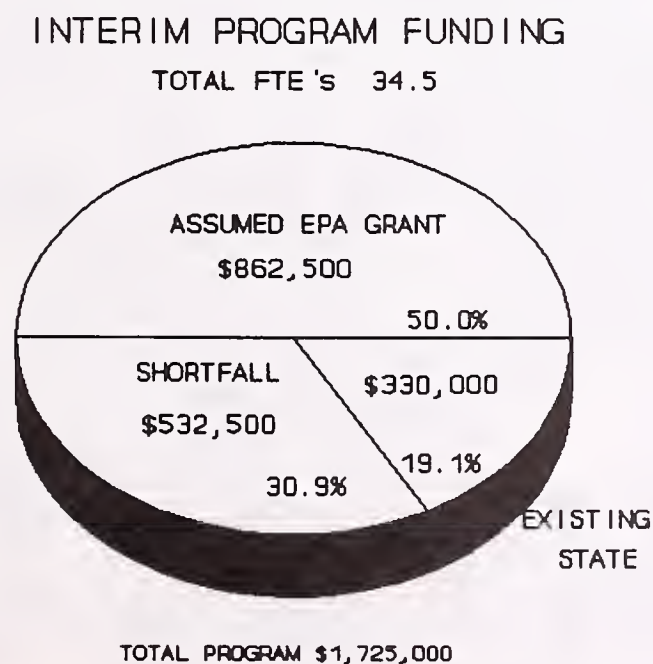


Figure 2 shows the revenue sources and funding needs for the interim program



Proposed Interim Program for the 1992-93 Biennium

The Task Force realizes that substantive changes to Montana's Public Water Supply Program are needed to assure safe drinking water within the state. Because increased resources and further study are not yet available to make program improvements, the Task Force recommends an Interim Public Water Supply Program. This interim program would retain primacy and provide required drinking water services. It would address only rules effective prior to July 1, 1993 since new federal regulations will be phased in over the next several years.

The Interim Public Water Supply Program would require 34.5 FTE's, of which 6.5 could be provided by pass-through funding to local governments, consultants, or organizations such as Midwest Assistance Program or Montana Rural Water Association. It is the view of the Task Force that this interim program will both retain primacy and adequately serve Montana's public water systems for the next two years.

For further information please contact:

Public Water Supply Section
Water Quality Bureau
Montana Department of Health &
Environmental Sciences
Capitol Station
Helena, MT 59620

FIFTY-SEVENTH ANNUAL SCHOOL

A total of 167 water and wastewater professionals attended the 57th annual school for water and wastewater operators and managers. The school was held in Bozeman, September 24-27, 1990. Over 100 took the certification exam on Friday.

It was a great school for everyone. Many thanks go to the speakers and attendees for their participation. We are all looking forward to next year.

Following are some snapshots taken at the school.....



HOWARD PEAVY!!

DICK PEDERSEN, WQB,
DISCUSSES LAGOON
OPERATOR AND
MAINTENANCE





**USE OF THE
MICROSCOPE
WAS A POPULAR
SESSION!!!**

**ROY WELLS AND
WELL CONSTRUCTION**



**A CAPTIVE
AUDIENCE!!!**

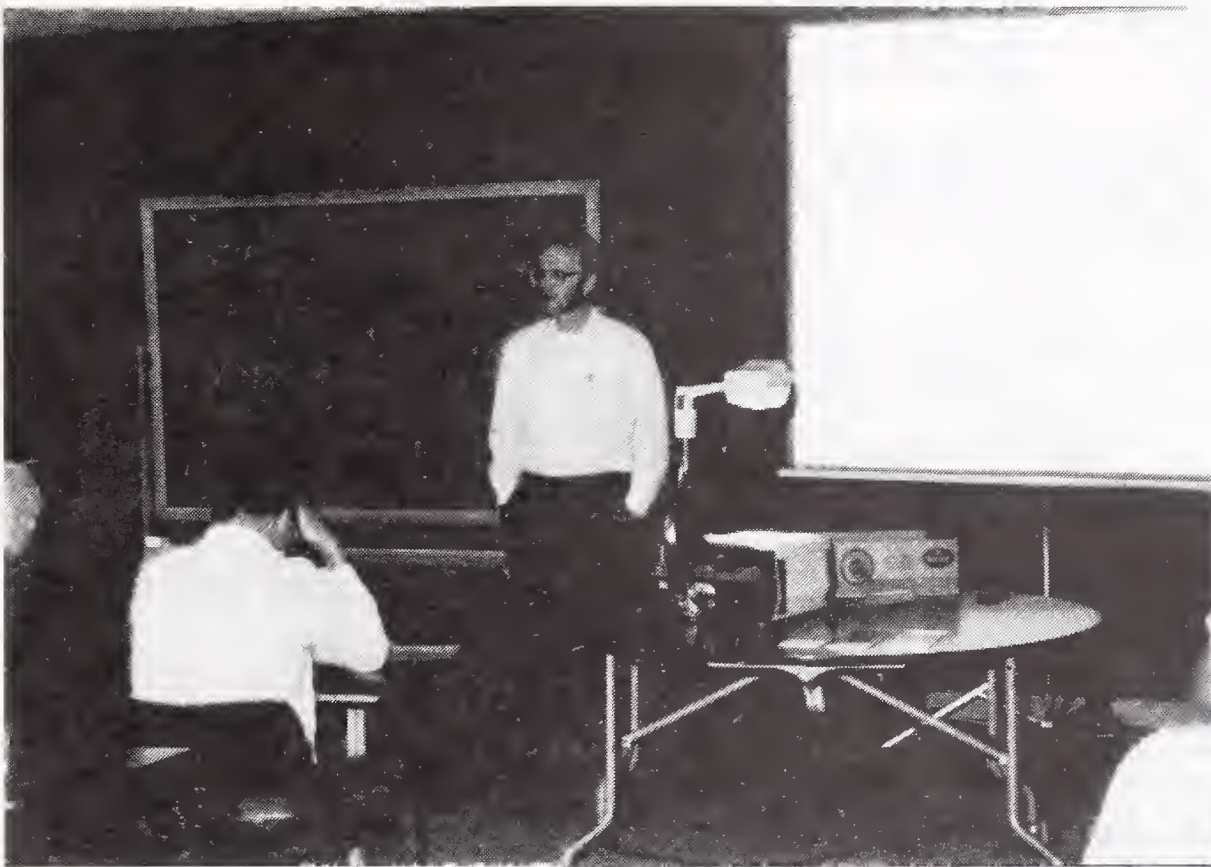


**RICHARD & LEWIS
ARE GOING TO GET
YOU FOR THIS ONE,
DORIS!!**

**167 PROFESSIONAL
OPERATORS!!!**



**SIR ELSTON, AND
THE KNIGHTS OF THE
ROUND TABLE!!!**



**GARY WEINS, WQB,
DISCUSSES WATER
STORAGE TANK O&M**



**THIS IS WHAT THE
SPEAKERS GET TO
LOOK AT!!**



**WHO NEEDS
A MICRO-
SCOPE?**

GET THE MOST OUT OF TRAINING !!

Dave Aune

Water Quality Bureau

Operator training in Montana is a cooperative effort of a variety of state and private organizations including the Water Quality Bureau. Each year, approximately 40 to 45 water and wastewater training sessions are offered covering 25 to 30 different topics. In addition, a week long water and wastewater school is offered in the fall of each year. This is a considerable training program and the organizations involved should be proud of that effort.

However, most training organizations agree that there are gaps in current training efforts. For example, only one session on a particular topic may be offered, requiring significant travel for some of those wishing to attend. At times, training has been limited by the ability to find affordable experts on certain topics. Also, some topics need to be covered over a longer period of time. In such cases, the operator needs time to absorb the information and a two- or three-day course or a class once a week over several weeks is more appropriate.

Unfortunately, it will be difficult for those organizations involved in training to bridge some of these gaps in the near future, if at all. It is important for the operator to realize these limitations and not limit his or her training to that

provided by existing organizations.

Don't limit your training options to those sessions offered in your immediate area. Again, current training organizations simply do not have the resources to provide a comprehensive training agenda in each corner of the state. A close review of the METC training calendar reveals a variety of training topics, but an operator may have to travel to attend some of the training sessions. I realize that it is difficult to get away and that superiors may be reluctant to allow such travel. But consider, for a moment, that the public has entrusted the operator with their health, environment, and public facilities. Also, consider the hazards associated with water and wastewater operation and the need to be able to guarantee your safety and that of others. Clearly, there is a very real need for competent operators and training is the surest and most trouble free path to competency.

Set aside a specific amount of time each year for proper training. Establish specific training goals and carefully plan your training efforts. Review the training calendar at the beginning of each year and plan to attend sessions that are consistent with your training goals. If the

training calendar does not provide you with what you need, then pursue other training through correspondence or other means. You may want to develop your own training through your utility or others. Some of the large utilities have their own training program and may be willing to work something out with a smaller system. Be sure to coordinate these efforts with the Certification Office if you wish to receive CEC's.

With regard to CEC's, the Certification Office encourages, supports and will approve reasonable requests for training outside of the traditional training sessions offered by the Water Quality Bureau and other organizations. Of course, it is necessary to closely critique courses approved for CEC's and the Department has procedures for approval (see accompanying article). The point is, the Water Quality Bureau is willing to work with the operator to meet his or her specific training needs. If you have any questions on available training or how to go about organizing in-house training, give us a call, we will try to assist you in any way we can.

When you attend a particular training session, it is important to keep an open mind. Don't assume that the idea or concept being presented does not apply to your particular situation. Attitude is an important part of getting the most out of training. Training is work and you will have to work at understanding how to apply what is being presented. It is important to go back to your system and try to apply what was presented at the training session. Because

there is not enough time in many sessions to provide sufficient detail, it may be difficult to apply what you have learned. You may have to go home and do some additional study to develop a full understanding of the concept and its applicability to your system. You may also want to use available technical assistance to help you implement a particular concept. Such technical assistance may be available through the Water Quality Bureau, Montana Rural Water Systems and other training organizations.

Further, when you attempt to apply a particular concept, you may find that the concept does not work exactly as presented at the training session. You will have to adapt it to fit your particular situation. You may have to adapt several times. Also, the results may not be immediate. Be patient, give the system time to react to the changes.

The bottom line is, plan your training efforts, don't limit yourself to the traditional training available if its not applicable, use the resources available to you including other utilities and existing training organizations, be open minded, try to implement the concepts presented, be patient for positive results and finally, supplement the information provided you with additional study. I would also encourage you to be actively involved in the development of the annual training agenda by the various organizations.

Let us know what you think, and what you need!!

ANSWERING YOUR QUESTIONS ABOUT CONTINUING EDUCATION CREDITS

*Rosemary Fossum
Operator Certification
Water Quality Bureau*

What do I have to do to earn a CEC?

Either by correspondence or in person, you must complete a course which is relevant to your certification. The course must be approved by the department for a stated number of credits or part-credit according to the number of contact hours required to complete the course.

How do I report the CEC's I have earned?

By sending the CEC report form to the certification office.

Suppose I know of a course I want to take but know that it hasn't been approved by the department. Could I get it approved?

Maybe. First, the course has to be somehow relevant to the operation and maintenance of water distribution systems, water or wastewater plants. Second, you must supply a complete course outline plus information on the course instructor or sponsor (address/qualifications), the date(s) of the course, the number of hours required to complete the course, the fees and prerequisites required. The APPLICATION FOR APPROVAL OF TRAINING FOR CONTINUING EDUCATION CREDIT, which requires this information, is the form used for course approval by the department.

Do correspondence courses have to be approved too?

Yes, any course for which CEC credit is given must be first approved. To date, applicable correspondence courses at Northern Montana College, California State University (Sacramento), Michigan State University, TPC Training Systems and Center for Disease Control have been approved.

Can I get CEC's for attending applicable seminars out of state?

Probably, if you can supply complete enough information to satisfy the approval process and can verify your attendance by obtaining the signature of the instructor or by providing a photocopy of a certificate of course completion.

Can CEC's be earned by training given "in-house" to all the personnel in a plant?

Yes, if the training is applicable and has been approved by the department.

Is it true that I can earn CEC's by teaching an approved class to other operators?

Yes. We believe organizing course content and materials and then presenting them in ways that will instruct a group is a learning experience worthy of credit. The instructor must first complete the APPLICATION FOR APPROVAL OF TRAINING FOR CONTINUING EDUCATION CREDIT to secure department approval and then must report the CEC earned from teaching on the CEC report form.

Can you send me a list of training courses which are approved for CEC's?

A training calendar is published in the CLEARWATER twice each year. Two to four weeks in advance of each seminar, operators in nearby areas will be sent specific agendas. Operators will receive similar notice of any newly added seminars.

* * * * *

SOME *WACKY* DEFINITIONS

Aerator - weather person
Aerobic - sheik's cigarette lighter
Backfill - enema
B.O.D. - something we all have, only some more than others
Chloride - boy and girl twins
Chlorine
Chloroform - extract of cauliflower used as an anesthetic
Comminutor - a castrated Communist
Composite sampler - multi-colored design hand embroidered picture
Contact chamber - hot tub
Dewatered - join A.A.
Digesters - alka seltzer
Effluent - your cup runneth out
Grit Chamber - John Wayne's john
Inflow - happy hour
Maximum Slump - touching your toes with your head
Nitrification - after which you're called Sir
Outfall - you need Head and Shoulders
Outlay reports - ? and tell
Primary clarifiers - kindergarten teachers

NEWS . . . ABOUT CERTIFICATION

By Rosemary Fossum

Water Quality Bureau Certification Officer

THE WATER AND WASTEWATER OPERATOR CERTIFICATION ADVISORY COUNCIL welcomes Mike Holzwarth, Colstrip's Municipal Services Supervisor, to a six-year term on the council. He is certified Class 1 in water and wastewater treatment; Class 2 in water distribution. Our heartfelt appreciation to David Brown of Great Falls for eight years of service on the council. Mark Richardson and Steven Ruhd are currently council Chairman and Vice-Chairman, respectively.

BY LAW, CERTIFICATION FEES MUST COVER THE COST OF THE PROGRAM. For the last three years, they have not done so. Expect a fee increase next fiscal year!

A FIVE-CHAPTER INDUSTRIAL WASTEWATER TREATMENT OPERATORS' MANUAL for oil refinery wastewater operators is soon to be completed. Chapter authors are Robert Olsen, Conoco; Bernard Gieser, Cenex; Dr. Howard Peavy, MSU; Tim Schug, Exxon; and Larry Field, Exxon. A special certification examination will be based upon this study material. The operator-authors will earn continuing education credits for their work. The oil refineries themselves are footing the bill for binding and printing this study material! The council, department, and state of Montana applaud this significant accomplishment!

THE OPERATOR TRAINING MANUALS OF THE OFFICE OF WATER PROGRAMS, Ken Kerri, Director, California State University, are now the recommended study material for those preparing to take Class 1 or 2 certification examinations or seeking valuable continuing education study. These operator-authored manuals must be purchased directly from CSU. Course enrollment is optional. Ask for manual brochures at any METC seminar. See the order form in this CLEARWATER issue.

THE NATIONAL ENVIRONMENTAL TRAINING ASSOCIATION (NETA) CERTIFIES ENVIRONMENTAL TRAINERS through examination and experience. Two popular instructors at Montana training seminars are Certified Environmental Trainers: Stephen Cheman and Doris Roberts. Bill Bahr is working on his CET.

WHAT ARE THE RESPONSIBILITIES OF THE CERTIFIED OPERATOR? The quick answer is, "whatever it takes to assure a safe drinking water supply or to discharge wastewater effluent without endangering state waters." System users expect "whatever it takes" to provide safe water or protect state waters will be done. Often they don't realize what's involved. Show them this list!

1. Sampling and/or monitoring to meet extensive legal requirements.
2. Keeping records for #1 above.
3. Being readily available in order to:
 - a. act on sampling, monitoring, and reporting to regulatory agencies.
 - b. respond to system inspections, system users, or DHES personnel.
 - c. react to system malfunction.
4. Issuing notice to users when the systems are not in compliance and there is a risk to health.
5. Protecting, maintaining, and/or operating equipment purchased at public or user expense to provide safe drinking water or process safe effluent.
6. Keeping records on the system maintenance program for #5.
7. Calculating and making chemical applications or removals in order to protect public health or state waters or parts of the system.
8. Understanding and preventing what may endanger a safe drinking water supply or wastewater effluent or equipment used to do the same.
9. Assuring that newly installed or repaired equipment or systems meet legal requirements adopted to protect the public health and environment.
10. Notifying the DHES of the termination of your responsibilities to a system and advising your replacement that he/she requires certification.

PASSING EXAMINATIONS FOR FULL CERTIFICATION OR OPERATOR-IN-TRAINING (OT) 9/28/90

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Richard Anderson, Chinook, 1A/1B ot
Philip Arends, Conrad, 1A ot*
Bruce Asay, Hillsboro, Or., 1C ot*
Roger Bevolden, Harlem, 1B ot
Stephen Carrick, Florence, 1C
Goldie Chapman, Bozeman, 1C ot
Barbara Coffman, Dutton, 1B/1C ot*
Andrew DePuydt, Missoula, 1C
Jeffrey Durham, Havre, 1B ot*
Joseph Friederichs, Glendive, 1B ot
William Haley, Vernal, Ut, 1B
David Harris, Miles City, 1B/1C ot
Daren Higginbotham, Forsyth, 1B*
Craig Hodgson, Missoula, 1C
Greg Johnson, West Yellowstone, 1B ot
Jim Johnson, Havre, 1B ot*
Mike Johnson, Missoula, 1C

Class 2: Edward Adams, Belgrade, 2A3B*
John Boyer, Columbia Falls, 2C ot*
Richard Clark, Hungry Horse Dam 2B
Bill Corbett, Libby, 2A ot
Richard Chylik, Great Falls, 2A*
Lyle Fogerty, Great Falls, 2B ot
Samuel Hancock, Missoula, 2C ot

Class 3: Philip Arends, Conrad, 3C*
Charles Buechler, Joliet, 3A4B*
Vernon Cook, Anaconda, 3A4B/3C
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David Dwello, Conrad, 3C ot
James Given, Anaconda, 3C ot
Alvin Hollatz, Plentywood, 3A4B ot
Mick Kammerer, Missoula, 3B
Dorothy Kouba, Circle, 3A4B ot
Svend Larsen, Plentywood, 3A/3C*

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Brian Buck, Columbia Falls, 4AB
Harold Charlton, Roundup, 4C
Harold Dixon, Bozeman, 4AB
Blane Gard, Sunburst, 4C
Glenn Howlett, Polson, 4AB
Leo Malinak, Valier, 4C ot
Ronald Page, Bozeman, 4AB
Joe Paine, Circle, 4C

Class 5: Pat Byrnes, Kalispell
Ronald Johnson, Bozeman
Gerald Pushard, Ramsay
Joe Seymour, Ramsay

Kevin Joyce, Bozeman, 1B ot
Mick Kammerer, Missoula, 1B
Paul Lear, Gardiner, 1B ot*
Rober Legare, Havre, 1A/1B ot*
James Lentz, Helena, 1A/1B ot*
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Robert Ward, Missoula, 1A; 1B-ot

Lee D. Murrell, Missoula 2C ot
Marlin Ostrander, Hamilton, 2A3B
Brad Pourroy, Conrad, 2B
Tony Porrazzo, Polson, 2A
Libby Ann Ray, Gardiner, 2B ot
Edward Sutherlin, Forsyth, 2B
Marvin Woelich, Forsyth, 2A*

Leo Malinak, Valier, 3A4B ot
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Danny Zinn, Chinook, 3C ot

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Please complete the following order form. Add up all the costs (Californians add 6% on cost of MANUAL ONLY). If appropriate, include postage. Once an order is received, it takes three days to process the order and UPS will take from two to ten working days for delivery, depending on the state where the order will be delivered.

INCLUDE YOUR CHECK, MONEY ORDER, OR PURCHASE ORDER, payable to **HORNET FOUNDATION, INC.**, in US\$, with this order form.

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Operation and Maintenance of Wastewater Collection Systems, Volume I	\$20	\$1.20	\$30	
Operation and Maintenance of Wastewater Collection Systems, Volume II	\$20	\$1.20	\$30	
WATER (POTABLE)				
Water Treatment Plant Operation, Volume I	\$30	\$1.80	\$30	
Water Treatment Plant Operation, Volume II	\$30	\$1.80	\$30	
Small Water System Operation and Maintenance	\$20	\$1.20	\$30	
Water Distribution System Operation and Maintenance	\$20	\$1.20	\$30	

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(Voluntary. Used for student computer identification of answer sheet and test scores.)

(If enrolling more than one student, attach additional sheet — include social security number for each person enrolling.)

ENFORCEMENT II . . . THE SAGA CONTINUES

Dean Chaussee
EPA - Montana Office

Enforcement activities have continued at a rapid pace in Montana over the past six months. In the last issue (July 90) we discussed the increased enforcement activities taking place in the Drinking Water Program. Much of the discussion at that time centered around activities of the U.S. Environmental Protection Agency (EPA). Many of those actions are now complete. Since that time, the State Water Quality Bureau has greatly stepped up its own enforcement activities and it will continue to be more active in the future.

Since July 1, 1990, EPA has issued final Administrative Orders (AO's) to 14 Montana public water supplies (PWS). Eleven of those were for bacteriological (bacti) maximum contaminant level (MCL) and monitoring violations. One AO was issued for both bacti and fluoride violations. Two of the AO's covered turbidity and bacti violations. Most all of these systems with previous monitoring violations have begun routine sampling. One of the systems with turbidity violations has now received notice that federal and state funds (FmHA, CDBG) are now available and they will soon begin construction on a new treatment plant.

The Department of Health and Environmental Sciences (DHES) has signed 10 bilateral compliance agreements with PWS's which have been periodically

out of compliance with the bacti regulations. In these documents, the PWS and the DHES agree on, and put down in writing, the steps the water system needs to take to return to compliance. Dates for completing these steps are also documented.

The DHES has also issued 29 administrative compliance orders for bacti monitoring and MCL violations. These documents spell out the system's violations and order them to come back into compliance according to a schedule determined by the Department.

The DHES also has court appearances scheduled during the next few months with two public water supplies which have more serious violations.

In the next six months both DHES and EPA will be following up on previously issued enforcement actions. In addition, EPA will probably concentrate on violations of the volatile organic contaminant (VOC) regulations and on violations of the Total Coliform Rule (TCR).

We all need to work together to provide the consumers on our water systems the "safe drinking water" they deserve.

VIRUSES IN DRINKING WATER

This article was compiled from portions of EPA Paper 600/2-90/0101 entitled, "The Use of Models for Granting Variances from Mandatory Disinfection of Ground Water Used as a Public Water Supply."

In November 1985, the United States Environmental Protection Agency (U.S.EPA) proposed a Maximum Contaminant Level Goal (MCLG) for viruses in drinking water, setting a level of zero viruses (Federal Register, 1985). For various technical and economic reasons, monitoring the water for the presence of viruses most likely will not be required; instead, various treatment techniques to eliminate or reduce virus contamination of drinking water were discussed. At that time, mandatory filtration and disinfection of surface water and disinfection of ground water were discussed as possible treatment requirements. Since then, treatment techniques for surface water were proposed and the final rule requiring surface water sources to be filtered and disinfected was published and went into effect on January 1, 1991.

To this date, treatment techniques for ground water have not been proposed. It is expected that mandatory disinfection of ground-water sources of drinking water will be proposed in the near future.

PROPERTIES OF VIRUSES

Some of the important properties of viruses are:

- o They are very small, ranging in size from approximately 20 to 200 nm ($1 \text{ nm} = 10^{-9} \text{ m}$) in diameter.
- o They are obligate intracellular parasites; that is, they are incapable of replication outside of a host organism. This means that, once in the environment, they cannot normally increase in number. This is different from bacteria, which can grow and multiply if the proper nutrients and environmental conditions are present.
- o They are very host specific. In other words, a virus that infects humans cannot, generally speaking, infect any other animals. This means that if a human virus is found in soil or water, there is conclusive proof that a source of human waste has contaminated the environment.
- o Viruses that replicate in the intestinal tract of man are referred to as human enteric viruses. These viruses are shed in the fecal material of individuals who are infected either purposely (i.e., by vaccination) or inadvertently by consumption of contaminated food or water, swimming in contaminated water, or person to person contact with an infected individual.

- o More than one hundred different enteric viruses may be excreted in human fecal material (Melnick and Gerba, 1980); as many as one million infectious units of enteroviruses (a subgroup of enteric viruses) per gram and 10 billion rotaviruses per gram may be present in the feces of an infected individual (Tyrell and Kapiklan, 1982).
- o Because they are shed in the fecal material of infected individuals, viruses are present in domestic sewage and, depending on the type of treatment process(es) used, between 50 and 99.999% of the viruses are inactivated during sewage treatment (Gerba, 1981).
- o Most of the viruses involved in waterborne disease outbreaks cause gastroenteritis. The symptoms of gastroenteritis include diarrhea, nausea, vomiting, fever and general malaise. Probably the most serious disease caused by a waterborne virus is hepatitis, which is caused by hepatitis A virus.
- o Viruses are generally more resistant to inactivation by various disinfection techniques than are bacteria.
- o The number of viruses required to cause disease is very low. It has been estimated that exposure to only one virus particle may be sufficient to result in infection.

SOURCES OF VIRUSES IN THE ENVIRONMENT

Viruses may be introduced into the subsurface environment in a variety of ways. Goyal et al. (1984) isolated viruses from the ground water beneath cropland being irrigated with sewage effluent. Viruses have been detected in the ground water at several sites practicing land treatment of wastewater; these cases were reviewed by Keswick and Gerba (1980). The burial of disposable diapers in sanitary landfills is a means by which disease-causing micro-organisms in untreated human waste may be introduced into the subsurface. Vaughn et al. (1978) detected viruses as far as 408 meters downgradient of a landfill site in New York. Land application of treated sewage effluent for the purposes of ground-water recharge has also resulted in the introduction of viruses to the underlying ground water (Vaughn and Landry, 1977; 1978).

Septic tank effluent may be the most significant source of pathogenic bacteria and viruses in the subsurface environment. Septic tanks are the source of approximately one trillion gallons of waste disposed to the subsurface every year (Office of Technology Assessment, 1984) and are the most frequently reported sources of ground-water contamination in waterborne disease outbreaks (U.S.EPA, 1977). The overflow or seepage of sewage, primarily from septic tanks and cesspools, was responsible for 43% of the reported outbreaks and 63% of the reported cases of illness were caused by the use of untreated water (Craun, 1985).

QUALITY CONTROL IN SEWER REHABILITATION

Dick Franklin, Edward Wu, Mike Rogers, City of Palo Alto Utilities

Abstract: Quality control in the construction of new underground pipelines is important to the assurance of a quality product. The same holds true for rehabilitation of existing pipelines. However, due to the short history of pipeline rehabilitation in the United States, it often becomes a problem identifying what quality control measures should be used. This is complicated further by the continuous influx of new pipeline methods.

This article looks at field quality control practices the City of Palo Alto performed in the sealing, sliplining and inversion lining of 42,000 linear feet of 4-inch to 10-inch sanitary sewers.

Two major ingredients are necessary for good quality control in the field: well written specifications and a full-time, experienced inspector. An inspector is powerless without well written specifications and well written specifications have little meaning if they are not enforced in the field. In the development of Palo Alto's quality control specifications for chemical sealing, sliplining, and inversion lining, the city consulted other municipalities and sewer districts who had ongoing sewer rehabilitation work, engineering consultants involved in the design of pipeline rehabilitation, the National Association of Sewer Service Companies (NASSCO) and the manufacturers of

sewer rehabilitation products. NASSCO has two excellent publications in this subject area: "Recommended Specifications for Sewer Collection System Rehabilitation" and "Inspection Handbook for Sewer Collection System Rehabilitation." Quality control specifications for sealing of sanitary sewers, sliplining and inversion lining were drafted, implemented by our utilities inspector(s) on sewer rehabilitation work and modified based on experiences in field.

Sealing of Sanitary Sewers

Sealing of sanitary sewers, often called chemical grouting, involves the use of a TV camera followed by a packing unit to seal defects in sanitary sewers. These defects allow groundwater and soil to enter the sewer system and include open joints, offset joints, cracks and missing pieces. All sealing work in Palo Alto is contracted.

Our inspectors were sent to a two day training session on chemical grouting, presented by Gelco Grouting Service, in Salem, Oregon. The session proved invaluable to their understanding of the sealing process.

When a sealing van first arrives on the job, it is directed to our Municipal Service Center where the inspector(s)

performs a visual inspection and above ground tests of the equipment. During the visual inspection, the equipment is checked against requirements of the specifications and against approved equipment submittals. Packers are checked to see if they have a mixing chamber and single hole orifice. This ensures a homogenous, catalyzed liquid. The volume of the void area on the packer, between the outside bladders, is calculated to determine how much sealant needs to be pumped before any is discharged into the pipe defects. Length of the void area should be no less than 6-inches. Void lengths less than this are difficult to center on any particular pipe defect. An inspection of the van is made to determine the functions of all gauges and controls. It is important that gauges are readable to one-tenth of a psi. Larger divisions require interpolation of the units in the field, which is time consuming and inaccurate.

After a visual inspection, tests are performed on the equipment to determine pump delivery, water to sealant ratio, gel time of the sealant and extent of mixing. Knowing the gpm of the pump, the gel time of the sealant and the void area of the packer, you can then calculate the amount of sealant that actually flows through the joint and into the soil. It's important that these three parameters, gpm of the pump, gel time and void area are known and properly balanced. The pump must be able to deliver the sealant before it sets. However, the sealant must set quickly enough to test, but not so quickly that it sets before it is delivered.

Footage counters and pressure gauges in the van are checked for accuracy. We've learned that footage counters generally

can not be relied upon. If the distance between sewer joints is known, it is far more accurate counting joints to a defect than relying on footage counters. Toting a measuring tape behind the camera may be the only true solution to this problem.

At the job site, the gel time of the sealant is checked several times daily. After the initial gel test, the packer is placed in an existing line and set up over a length of pipe with no joints. The bladders are inflated to approximately 25 psi and the void pressurized to 8-10 psi. The static pressure is checked to see that it holds for a minimum of 15 seconds. A leaking packer can result in numerous joints being unnecessarily sealed. A failed joint in Palo Alto is one which leaks more than 1 psi in 14 seconds. For this reason, it is also important to clean the pipe(s) prior to sealing.

Our inspector stays with the sealing contractor throughout the work to verify pipe defects and the quantity of sealant used. The inspector also maintains his own group logs as a backup to the contractors. The contractor is paid by the number of defects air tested and the gallons of sealant used.

After all work has been completed and just before the expiration of the one-year guarantee period, the contractor is required to retest 10 percent of the reaches sealed. The inspector selects the location of the reaches and the time of year to retest. In each retested reach, the contractor is required to air test all previously sealed I/I defects and joints. All defects and joints failing the test are resealed. If the failure rate exceeds 5 percent of joints tested in any individual sewer reach, the contractor must retest another reach chosen by the inspector.

This additional testing and sealing continues until a failure rate of less than 5 percent is met. The contractor must also clean all sewer reaches chosen for retesting immediately before and following all air testing and sealing work.

Through experience we have learned that the following defects are difficult, if not impossible to seal:

1. Defects adjacent to lateral connections, manholes and cleanouts
2. Longitudinal and spiral cracks longer than the effective length of the packer. With the sealing of these types of cracks you also run the risk of proliferating the crack when pressure from the packer is applied.
3. Broken or shattered pipe

In addition, mineral deposits, severe offset joints or protruding taps sometimes prevent the passage of the video camera and packer unit.

Editorial Note: Engineers within the Water Quality Bureau do not consider chemical grouting to be a long term solution to infiltration problems. This is especially true in areas with fluctuating groundwater elevations. Water Quality Bureau experience with chemical grouting has not been entirely favorable.

Sliplining of Sanitary Sewers

Sliplining is the insertion of a polyethylene liner pipe into an existing sewer line. The intent is to provide a continuous watertight pipe from manhole to manhole. ASTM F-585 "Standard Practice for Insertion of Flexible Polyethylene Pipe Into Existing Sewers," is a useful reference for this type of work.

In Palo Alto, sliplining work begins by inspection of the pipe and qualification of the welders. Pipe markings, such as manufacturers name, cell classification number per ASTM D3350 and dimensional ratio are checked against requirements of the specifications. The pipe is checked to see that it is homogenous throughout and free of:

1. Serious abrasion, cutting or gouging of the outside surface extending to more than 10 percent of the wall thickness in depth.
2. Cracks
3. Kinking (generally due to excessive or abrupt bending)
4. Flattening
5. Holes
6. Blisters
7. Other injurious defects

Pipe welders are qualified by the passing of visual and bend tests of their welds. These tests are performed by our gas distribution crew, who use polyethylene on a daily basis.

After cleaning, the existing sewer is proofed. This consists of pulling a 4-foot piece of polyethylene liner pipe, of the same size as the liner to be installed in the sewer, through the entire length to be sliplined. The proof piece is pulled by hand, not by mechanical equipment. It has a pulling head on both ends of the pipe and a tag line to assist in its removal if an obstruction is encountered. A blockage preventing the proof piece from continuing down the line or a

gouge showing up on the proof piece extending to more than 10 percent of the pipe wall thickness is cause for spot repair. A new proof piece is used for each reach proofed. Otherwise it becomes difficult to identify which line caused a particular gouge. Proofing continues until the proof piece moves freely through the reach to be sliplined.

During insertion it is important that the liner be supported on rollers throughout its entire length to avoid gouging of the pipe wall. If the line is pulled, the pulling apparatus is equipped with a load gauge and the maximum allowable stress on the liner held to approximately 1000 psi.

After the relaxation period (minimum of one hours), service saddles are either welded directly to the polyethylene liner or strapped on with stainless steel clamps. The saddles are then air tested with low pressure air.

Grouting of the annular space is performed after all service connections are made. The volume between the liner pipe and the existing pipe is calculated. The inspector then ensures that at least 95 percent of the calculated volume is pumped into the void area. Test cylinders of the grout are taken and tested for compressive strength.

After grouting, a final proof of the liner is made by pulling a proof piece, 1/2 inch less in diameter than the ID of the liner, through the entire sliplined reach.

Inversion Lining of Sanitary Sewers

Inversion lining is the lining of an existing sewer with a felt tube

impregnated with resin. The tube is fitted tightly against the inside pipe wall by water pressure or steam and then heat cured. Video inspection and cleaning before lining is important as the liner will conform to the inside pipe. A collection of solids, protruding service connections, or offset joints will reduce the inside diameter of the pipeline.

From the contractor, we request detailed procedures of how the liner is to be installed. They are subsequently held to this procedure. We also require the contractor to obtain samples of the cured pipe on each reach and have it tested for average outside diameter, average inside diameter, minimum wall thickness, pipe stiffness at 5%, flexural modulus and tensile strength at yield.

After curing of the liner and before any service connections are reinstated, the contractor runs an exfiltration test on the liner to determine if it is watertight.

Laterals are then reinstated by an internal cutting device. Our inspector is present full time during this operation to insure that no unnecessary holes are punched in the liner.

Conclusion

Good quality control in sewer rehabilitation requires well written specifications and experienced inspectors. Documentation of daily work by inspectors is important. It communicates field experiences to office engineers. It is equally important that office engineers communicate changes in specifications to their inspectors. This team effort leads to a quality product.

PRETREATMENT AND THE SMALL POTW

Bill Engle
EPA - Montana Office

What is "pretreatment" and how does it affect you at your wastewater treatment plant? This question and, hopefully, many others will be answered for you in this article and at workshops to be held around the State.

Wastewater that arrives at your treatment plant generally consists of a mixture of sanitary sewage, industrial wastes and wastes from commercial establishments. Wastewater discharged by some industries and certain commercial establishments can be contaminated by a variety of toxic pollutants that could pose serious hazards. "Pretreatment" is the process of removing those toxic pollutants from the wastewater before it is discharged to the municipal collection system leading to the publicly owned treatment works or POTWs.

Pretreatment programs are implemented by the municipalities that operate the POTWs. The programs are needed to eliminate toxic industrial pollutants (1) that may pass through the treatment plant and pollute the receiving water; (2) that may interfere with the operation of the treatment plant; (3) that may contaminate sludge; (4) that may corrode the pipes and equipment in the sewage collection system and the treatment plant; (5) that may cause an explosion to occur; and (6) that may produce toxic gases which pose health hazards to workers in the sewers or at the treatment plant.

The Environmental Protection Agency has developed regulations under the Clean Water Act that control industrial or commercial discharges into sanitary sewers. These regulations, called the Pretreatment Regulations, are divided into two sets of rules. The "prohibited discharge standards" prohibit any discharge to sewer systems of certain types of wastes. The general prohibitions specify that pollutants introduced into POTWs by a nondomestic source shall not pass through the POTW untreated or interfere with the operation or performance of the POTW. The specific prohibitions specify prevention of discharge of pollutants (1) that create a fire hazard or explosion hazard in the collection system or POTW; (2) that are corrosive ($\text{pH} < 5.0$); (3) that are so solid or viscous that they will obstruct the flow in the collection system or interfere with the operation of the POTW; (4) that is in such quantities that they will interfere in the operation of the POTW; or (5) that are discharged with temperatures above 104 degrees F when they reach the POTW.

The "categorical pretreatment standards" regulate the level of pollutants discharged into the collection system from 24 specific industries that are specified in the Federal Register. The regulations require these industries to reduce the discharges of 126 toxic pollutants identified by EPA as having the greatest potential to harm human health or the environment. These industries are timber products, electroplating, iron and steel, inorganic chemicals, textile mills, petroleum refining, pulp, paper and paperboard, electric steam, leather tanning, porcelain enameling, coil coating, electrical and electronic components, metal finishing, copper forming, aluminum forming, pharmaceuticals, can making, nonferrous metals, plastic molding and forming, pesticides, foundries, and organic chemicals and plastics and synthetic fibers.

Every POTW is involved in the pretreatment program. If you have ever had something come into your POTW that causes the effluent to be a different color, that is oily or greasy, that has a different odor to it, or that has created operational problems, you have been involved with pretreatment problems. If any of these occur, you should immediately start looking for the source of the problem in your collection system. They could be occurring because of some chemical that is being discharged by an industry or commercial establishment that is connected to your collection system.

The Water Quality Bureau and the EPA are planning several one day workshops on the Pretreatment Program for the small POTW facility during the month of May. Notices will be sent out in April giving more details on the workshops. You are urged to attend one of them to learn more of the details on how you can prevent problems at your POTW that may be caused by industrial or commercial wastes.

In the meantime, if you are having an occasional problem at your POTW that you suspect might be caused by an industrial or commercial waste, call Joe Strasko at the Water Quality Bureau. He'll be glad to work with you in tracing down the problem.

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1991 NATIONAL OPERATION AND MAINTENANCE EXCELLENCE AWARD

The Office of Municipal Pollution Control of the U.S. Environmental Protection Agency is pleased to announce that nominations for the 1991 National O&M Excellence Award are being invited from all eligible communities. Awards will be made in nine categories according to plant size and type of treatment. There are also categories for non-discharging systems and most improved facility. Those communities wishing to submit nominations for any of the categories are encouraged to contact Scott Anderson or Paul Montgomery of the Montana State Water Quality Bureau for application forms, questionnaires and eligibility information.

Application packages submitted to MDHES will be evaluated by Water Quality Bureau staff members for recommendation to EPA's Regional Office. Winners for each of the nine Regional O&M Excellence categories shall be selected by the Regional Office based on review of the submittal packages. These facilities shall then become eligible for the National Awards in their respective categories. EPA Headquarters shall solicit national experts in wastewater O&M through WPCF, NETA, ASIWPCA, etc., who will then select the nine first-place and nine second-place winners.

All nomination packages must be post-marked no later than April 23, 1991, so, contact us today and request an application.

SHOULD POTWs BE CONCERNED WHEN ACCEPTING PETROLEUM CONTAMINATED WASTEWATER ????

*Joe Strasko
Water Quality Bureau*

Recent requests have been made to municipalities to accept wastewater from petroleum underground storage tank cleanups into city collection systems for treatment at the public owned wastewater facility. Such wastewaters may be contaminated groundwater that has been extracted and treated; contaminated storm water that has been collected and treated; wastewaters that are generated from tank cleaning operations; or contaminated water that results from product recovery operations.

Any discharge, other than sanitary wastes, into a sanitary sewer collection system is regulated by Pretreatment Regulations. Please see previous article.

The Water Quality Bureau recommends that wastewaters from petroleum cleanups only be accepted by municipal treatment facilities if the wastewaters are provided treatment prior to being discharged to the collection system. If this type of waste is accepted, a legal mechanism, such as a permit or city ordinance, must be used to restrict pollutant concentrations that may cause fire or explosion hazards and interference in the wastewater plant. A chemical analysis indicating that the wastewater meets the limits listed below must be required by a municipality before accepting the wastewater.

While there are hundreds of constituents in petroleum products that may be of concern, the principal constituents of concern in petroleum contaminated wastewater are Benzene, Toluene, and Xylenes (BTX). A study by EPA showed that while a POTW's biological treatment system can reduce the levels of BTEX, the actual degree of treatment at a particular POTW may vary widely (from 5% to 95%) with a median removal of around 75%. Consequently, EPA has recommended that the following limitations and monitoring requirements be placed on these types of wastewaters before they are allowed to discharge into the sanitary sewer system:

<u>Effluent Characteristic</u>	<u>Discharge Limits</u> Micrograms/liter		<u>Monitoring Requirements</u>	
	<u>Daily Avg.</u>	<u>Daily Max.</u>	<u>Frequency</u>	<u>Sample Type</u>
Flow, gpm	Report	Report	Weekly	Continuous
Benzene	50	50	Weekly	Grab
Total BTEX*	750	750	Weekly	Grab
Petroleum Hydrocarbons, Total Recoverable**			Weekly	Grab

The pH shall neither be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored once per week by grab sample.

* Method 602 shall be used for the measurement of BTEX.

** Method 418.1 (Spectrophotometric, Infrared).

POTWs may develop limits different from the above-recommended guidance limits for their specific facility by utilizing the "Guidance Manual on the Development of Local Discharge Limitations Under the Pretreatment Program." Please contact the Water Quality Bureau for more specific information.

For gasoline cleanups, monitor for BTEX. For diesel fuel cleanups, monitor for BTEX and Total Petroleum Hydrocarbons.

There are two additional pretreatment regulations that must be complied with when accepting this type of waste. Rule 40 CFR 403.5(b)(8) prohibits the discharge of trucked or hauled pollutants except at discharge points designated by the POTW. Therefore, the POTW must designate an acceptable discharge point. Rule 40 CFR 403.5(b)(6) prohibits the discharge of petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through.

NATIONAL PRETREATMENT PROGRAM AND (POTW) IMPLEMENTATION REQUIREMENTS SEMINAR

This seminar will offer an overview of the National Pretreatment Program as it relates to all POTWs. The agenda will include an introduction to the general pretreatment regulations, POTW legal authority and implementation responsibilities, technically-based local limits, industrial waste survey, industrial classification, categorical standards, industrial user permitting, monitoring and inspections, and compliance and enforcement. This program has been designed for small communities that do not have a pretreatment program. However, communities with pretreatment programs are encouraged to attend.

CEC's:	0.6	
FEE:		
SPONSOR:	METC (761-0417)	
DATE & LOCATION	May 21	Butte
	May 22	Kalispell
	May 24	Havre
	May 29	Billings

NEW DIRECTOR APPOINTED



Dennis Iverson, Director

Governor Stan Stephens has selected Dennis Iverson, an authority on environmental and natural resource issues in Montana, as the director of the Department of Health and Environmental Sciences.

Iverson was a Republican state legislator from 1979 until his resignation in August. During his ten years as a lawmaker, he was actively involved in natural resource and environmental issues. The Liberty and Toole County farmer and rancher chaired the legislature's Environmental Quality Council from 1981 through 1987 as well as the Natural Resource Committee in the 1981 and 1985 sessions. The 1987 Speaker Pro Tempore served on the House Appropriations' Natural Resource Subcommittee in 1989, the Water Policy Committee from 1985 through 1989, the State Water Plan Advisory Council, and is a member of the Reserved Water Rights Compact Commission.

Those of us in the Water Quality Bureau wish Dennis the best in his new position and look forward to working with him in our service to the public.

CHANGES IN MANAGEMENT AT THE WATER QUALITY BUREAU

Steve Pilcher appointed Division Administrator

Steve Pilcher was appointed Division Administrator of the Environmental Sciences Division of the Department of Health and Environmental Sciences in October of 1990. Steve replaced Larry Lloyd, who retired this past summer. Steve had been Chief of the Water Quality Bureau since 1979. Steve started with the Bureau in 1972 as an Environmental Specialist. The Environmental Sciences Division includes all environmental programs within the Department, including the Occupational Health Bureau, the Food and Consumer Safety Bureau, the Air Quality Bureau, the Solid and Hazardous Waste Bureau and the Water Quality Bureau. Steve is married with three children. His biggest interest outside of work and family has been racing and showing horses, where he has enjoyed considerable success. We wish Steve well in his new position!



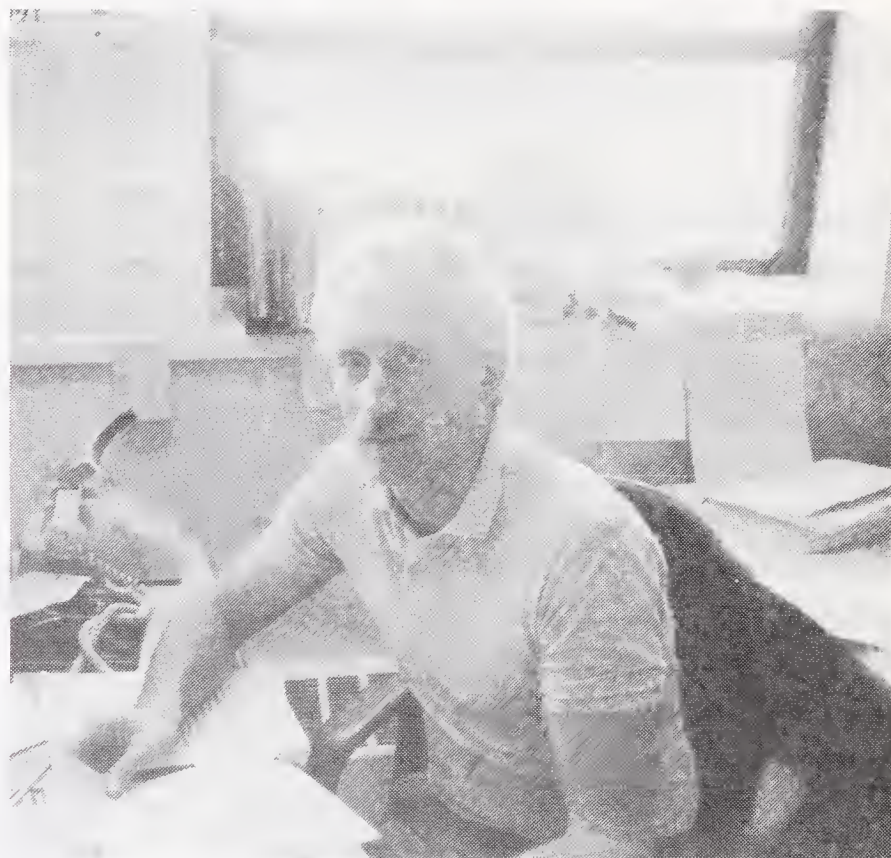
Dan Fraser New Bureau Chief

Dan Fraser has been appointed the new Water Quality Bureau Chief to replace Steve. Dan had been manager of the Public Water Supply Section since 1979, and has been with the Bureau since 1976. Dan will manage the sections and programs within the Bureau, which include the Discharge Permits/Groundwater Section, the Municipal Wastewater Assistance Section, the Public Water Supply/Subdivision Section, the Water Quality Management Section and the Technical Studies and Support Section. Dan is President-elect of the Association of State Drinking Water Administrators, and is Chairman-elect of the Montana Section of the American Water Works Association. Dan is married with 5 children. We also wish Dan well!

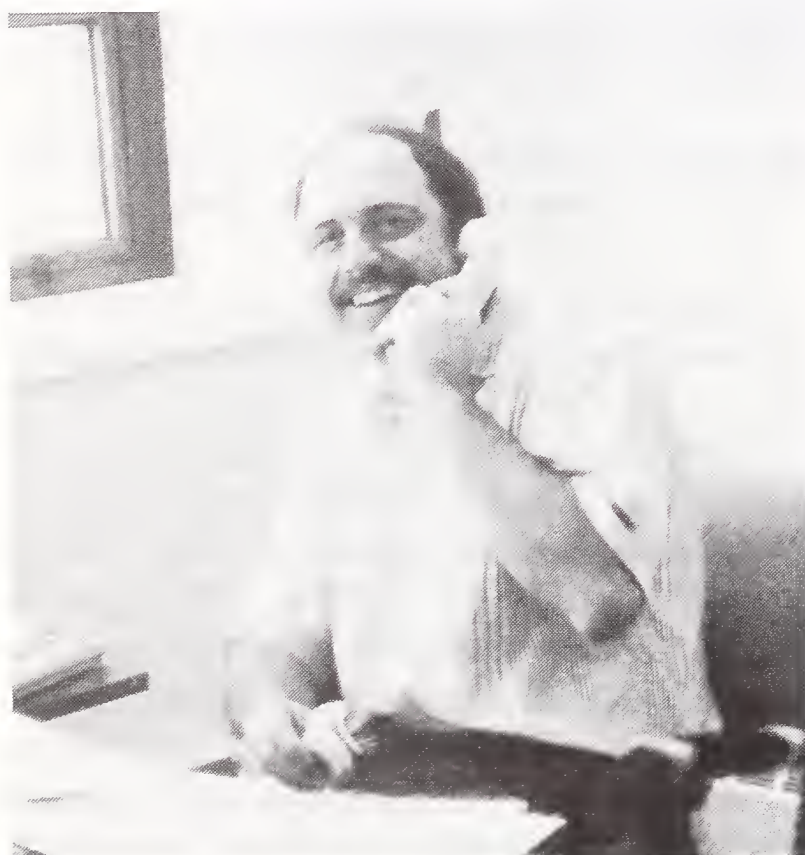


Jim Melstad promoted to Manager of Public Drinking Water Section

Jim Melstad has replaced Dan Fraser as the manager of the Public Drinking Water Section. Jim began his career with the Department in 1976 as an environmental engineer with the former Subdivision Bureau. He remained in Subdivisions for two years before taking an engineering position with the Public Drinking Water Section. Jim has a masters degree in engineering from South Dakota State, is married, enjoys running and has been known to score baskets for the wrong team. We all wish Jim the very best in his new position.



Dick Pedersen Moves On



Dick Pedersen, a long-time employee of the Water Quality Bureau, recently resigned from his position as Environmental Specialist in the Construction Grants Program. He will now be employed as a Program Officer within DHES in charge of coordinating activities related to the State of Montana's environmental resource damage lawsuit filed against ARCO for problems related to mining activities in the Upper Clark Fork river basin.

Dick, a native of Montana, attended school at Carroll College and began his career with the WQB as a field and lab technician in 1976. After working in the bureau's MPDES Discharge Permit Program for a number of years, Dick joined the staff of the Construction Grants Program in 1986 where his primary activities involved the training of water and wastewater operators, the inspection and evaluation of wastewater treatment systems and directing the activities related to the bureau's statewide operator training goals. Dick was instrumental in the creation and development of the Montana Environmental Training Center, a joint effort between the bureau and Northern Montana College, to coordinate statewide training activities.

Dick has worked with most of the wastewater operators throughout the state either at training workshops, the annual water school, or through specific onsite training. His ability to set a crowd at ease, his respect for the profession of wastewater operators, and his knowledge of wastewater treatment processes has made him a valuable asset to individuals working in the field. As recipient of the John L. Bartlett Employee of the Year Award at DHES in 1988, Dick has also been recognized by his peers in the Department for his abilities. Dick will be sorely missed at the Water Quality Bureau but will continue to be a resource for the Department and the State of Montana in his new position as Program Officer.

We all wish him well in his new job!!

METC UPDATE

by Jan Boyle, METC Coordinator

GREETINGS!

As the "new kid on the block" in water and wastewater operations, the past 10 months as METC Coordinator were busy and exciting. Surrounded by a supportive and encouraging Steering Committee, I was able to put some "definition" to my position as METC Coordinator. Putting the logistics together for each METC workshop and attending most of them brought me into closer contact with water and wastewater professionals throughout Montana. Visiting with these folks about the many aspects of water and wastewater was truly enlightening, to say the least. Since a part of my job is to conduct the METC sponsored workshops, my attendance at each workshop allowed me the opportunity to learn about the many technical "ins and outs" of water and wastewater treatment from a diverse group of knowledgeable instructors. And, perhaps, more importantly, I had the opportunity to "feel" the spirit, so-to-speak, of those folks involved in the business of water and wastewater. To be sure, the range of thoughts, ideas, opinions and knowledge pertaining to the subject of water and wastewater varied, but then, too, there were those "common threads" that seemed to bring them all together at these workshops. From this position, I felt that I could be an integral part of providing future workshops that would

meet the needs of these operators as well as their interests. You know, another big part of a needs assessment doesn't just concern the operators but also involves targeting those "significant others" such as administrators, town board and city council members that are involved in decision making situations of a water and wastewater nature. Bringing them to a comfortable understanding about what the operator's job involves can bring about workable efforts on the part of both to provide a community with an efficiently operating water and wastewater system. I'm looking forward to continued success in these areas as we go into 1991.

1990 saw an increase in the number of METC sponsored and/or co-sponsored training workshops from 24 in 1989 to 29. A total of 605 water and wastewater professionals attended these 1990 workshops compared to 471 in 1989. The average attendance of each workshop was nearly 21 people. The Water System Operation workshop held in Miles City on April 25 brought 37 attendees, the largest number for any single workshop in 1990.

New in 1990 was a Train-the-Trainer Workshop held in Great Falls on

February 9th. There were 18 participants from METC's steering committee and advisory committee as well as some from the Water Quality Bureau and Northern Montana College. There were also some other invited individuals interested in training development. Techniques of presenting workshops and establishing goals and objectives was the focus of this course. I hear tell that it was an excellent workshop! (Too bad I missed it!)

A new brochure (printed on recycled paper) describing METC was developed and distributed to workshop participants as well as to other interested individuals and organizations. A new Water Quality Technology Training Resources catalog listing METC's lending library books, audiovisual materials and approved correspondence courses was also developed. This catalog has been and will be made available to all water and wastewater professionals at workshops as well as at the Operator School in Bozeman. 1991 promises more "polished" versions of these publications! The METC van really "hoofed" it this year, logging 9800 miles over the state of Montana. I wonder what 1991 will do to that figure!

By the time you all read this, you should have received the new 1991 Training Calendar. You should notice that we located the workshop description section to the rear of the calendar to accommodate those who like to hang their calendars up (like me!). Training offerings reflect some "oldies but goodies" such as basic electricity, disinfection, safety and water system

operation as well as some new seminars that focus on a national pretreatment program, leak detection, grants and loans, and public notification requirements. And for you wastewater folks in particular, a 3-day workshop at beautiful Yellow Bay on Flathead Lake offers "hands-on" instruction in process control of activated sludge. Is this for real?

It certainly promises to be an exciting and interesting year of training. You can be sure that many of the seminars offered are a response to your indicated interests on the Operator Survey conducted in the early fall of 1990. Be sure to check out all the training courses offered and I look forward to seeing you all there! Again we always welcome any of your ideas or suggestions, so feel free to call me any time - Jan Boyle at 761-0417.

HAPPY 1991!

HOST CITY COMMITTEE PLANS MISSOULA CONFERENCE

Tim Hunter, City of Missoula

The Host City Committee has been meeting on a regular basis in Missoula to plan for the 1991 AWWA/WPCF Montana Conference. The biggest news is that this year's annual meeting will be held on May 9 and 10, 1991 and not near the end of March as has been the traditional meeting time.

We are excited about the upcoming conference and we are sure that those who attend will not be disappointed. The conference will be preceded by a pre-conference workshop on Wednesday, May 8, 1991. The workshop will feature a gifted speaker who many of us know and have missed since he left Montana, Amit Amirtharajah. The pre-conference workshop will be an all day affair on a water treatment topic and the cost is estimated at \$50 per person. Contact one of the Joint Education Committee Co-Chairmen, Jim Kaercher (245-6354) or Howard Peavy (994-6130), for further information about costs and registration. The main conference kicks off at 8:00 a.m., Thursday, May 9, 1991. The program committee has done an excellent job in lining up quality speakers for the technical sessions. See the tentative agenda included herein.

What about entertainment? Well, we had so much fun with the band last year that we persuaded them to return. Yes, ROB QUIST AND THE GREAT NORTHERN BAND will be in Missoula at our conference hotel on Thursday, May 9, 1991. As attendees, you will receive a ticket to this concert and dance free of charge. We are going to offer tickets for sale to the general public also, at a cost (tentative) of \$9.00 each. If you want extra tickets, please indicate so on your registration form. Registrants will be eligible to purchase additional tickets at a reduced price of \$8.00 each.

The conference will be held at the Village Red Lion Inn, next to the river and near the Van Buren Street bridge (sometimes called the "Edgewater"). Their remodeling is complete (remember last time?). The facilities are quite comfortable and the staff has been very helpful.

The committee has come up with some exciting plans for spouses who attend the conference. A horse-drawn wagon will tour the streets of Missoula with spouses of the conference attendees on Thursday. A trip to Missoula would hardly be complete without a visit to Southgate Mall, so you can bet that will be on the agenda. We have also found a fantastic motivational speaker who will not only help spouses with handling the stress of their day-to-day existence, but will entertain and delight in the process. (She's a crack-up!)

Other activities which are planned for this year's conference include: a fun run/walk on Missoula's beautiful downtown riverfront walkway; tours of a local wood products manufacturer's facilities; and visits to the nearby water and wastewater facilities.

Please fill out the attached pre-registration form as soon as possible and mail it to us so that we can begin to figure out how many plan to attend. See you in Missoula.

*** PRE-REGISTRATION FORM ***

1991 ANNUAL AWWA/WPCF CONVENTION

May 9-10, 1991
Missoula, Montana

Pre-Registration information must be received by March 15, 1991! Make check payable to the **AWWA/WPCA Host City Committee** and mail it along with the following information to:

AWWA/WPCA Host City Committee
P.O. Box 5172
Missoula, MT 59806

Name _____
(Last) (First) (Middle initial)

Title _____

Organization _____

Mailing Address _____

City, State, Zip _____

Spouse/Guest Name (if attending) _____

☐ Check here if you are interested in pre-conference workshop

☐ Check here if you are interested in the Fun Run/Walk

*** REGISTRATION FEES ***

AWWA and/or WPCA Members	\$85.00	_____
AWWA and/or WPCA Members (one day only)	60.00	_____
Non-Members*	95.00	_____
Non-Members (one day only)	70.00	_____
Spouse/Guest (all meals included)	25.00	_____
Additional Luncheon Tickets: Thurs. _____ Fri. _____	8.00	_____
Additional Thursday Banquet Tickets	18.00	_____
Additional Rob Quist/Montana Band Concert Tickets	8.00	_____

TOTAL REMITTANCE \$ _____

*Non-members joining now: Enclose completed membership application and one year's dues; then register as a member.

1991 MSAWWA/MWPCA ANNUAL CONFERENCE

TENTATIVE AGENDA

May 9, 1991

JOINT SESSIONS

- 8:00 AM Call to Order, Welcome, Invocation, Response
- 8:30 AM Guest Speaker - Chuck Brooke, Director, Department of Commerce
- 9:30 AM "Local Strategies for Protecting Groundwater Supplies"
Ed Hale, Panhandle Health District, Idaho
- 10:15 AM ***** BREAK *****
- | | | |
|------------|---|---|
| 10:30 AM | AWWA
New Drinking Water
Regulations
Donna Jensen, WQB | WPCF
Wastewater Pretreatment
Joe Strasko, WQB
Bill Engle, Montana EPA |
| 11:15 AM | To Be Or Not To Be
Small System Viability
Dan Fraser, WQB | Selector Channel Technology
Joe Steiner, City of Billings |
| 12:00 Noon | ***** LUNCHEON ***** | |
- AWWA National Representative
Formal Committee Reports
- | | | |
|---------|---|---|
| 2:00 PM | AWWA
Restraining Joints
Leon T. Fowles, DIPA | WPCF
Sludge Composting
Bob Dawson, Stanley Engr. |
|---------|---|---|

2:45 PM	Pre-conference Speaker Amit Amirtharajah	Kalispell's Phosphorus Removal Plant Bob Dawson, Stanley Engr. Dennis Carver, Carver Engr.
3:45 PM	***** BREAK *****	
4:00 PM	Public Water Supply Image - Risk Communication Public Notice, PR	Extending the Life of Wastewater Plants Harold Thompson, Denver EPA
5:30 PM	***** EXHIBITS AND HOSPITALITY *****	
7:30 PM	***** BANQUET AND SHAKIN' IT *****	

May 10, 1991

JOINT SESSIONS

8:30 AM	Contractor Claims - What to do About Them Dave Schachterle, Attorney, Denver EPA
9:30 AM	Public Finance for Water and Wastewater Projects Mae Nan Ellingson, Attorney, Dorsey and Whitney, Missoula
10:45 AM	***** BREAK *****
11:00 AM	Contamination of Groundwater by Gasoline Bill Peery, Hydrometrics
12:00 Noon	***** LUNCHEON *****

WPCF National Representative

1:30 PM	Budget Session and Business Meeting
2:30 PM	Adjourn

A MESSAGE FROM YOUR AWWA NATIONAL DIRECTOR

Richard A. Nisbet, P.E.
Montana Section AWWA Director

Carol and I attended our first annual AWWA National Director's Conference from June 15-22, 1990, in Cincinnati, Ohio. Ralph Dunahoo and Bob Millons informed me that the Director's experience would be overwhelming. With this knowledge, Carol and I approached our first conference with some apprehension, and Bob and Ralph certainly didn't use enough adjectives to describe how much work and social affairs can be crammed into such a short period of time.

As a freshman (one-third of the board is new each year), you do a lot of observing, listening and trying to figure out what is going on. The agenda items, both for the outgoing and incoming board members, move extremely rapidly as these items have obviously had a lot of discussion in the past.

My initial observation of the National Director's operations is as follows:

1. Many of the directors represent extremely large AWWA sections, but they all have a sincere concern for the impact of regulations, fee structures and other issues that impact small sections. I was impressed with their concerns.
2. The new Environmental Protection Agency (EPA) regulations that we have been receiving for the last several years are AWWA's primary focus of concern. Various committees reported on topics I hadn't even heard of. They investigated the impacts of their topic on all of our association sections.

Ralph warned me about the unbelievable politicking that went on to get elected to a national office of our association. After meeting the candidates running for vice president and seeing the qualifications and sincerity each has towards becoming a national officer, it is difficult to make a decision as to whom is best qualified. I discussed the qualifications of the top candidates with the AWWA Montana Section Board at the fall meeting. It was decided that we should lend our support to the candidates who are more concerned with small systems. After reviewing the three candidates, I intend to support Robert Reinert from New Jersey. He has been affiliated with a small systems committee for many years and is sincerely devoted to working hard to keep the small system program rolling.

I serve on a special task force that was appointed to review the needs of the Water Quality Bureau in order for them to retain primacy in enforcing the Safe Drinking Water Act. A more detailed explanation of the recommendations of the Task Force is included elsewhere in this issue of the Big Sky Clearwater. By the time you receive this issue, legislation will already be introduced. Each member needs to contact their legislators and urge them to support Water Quality Bureau funding for the adequate enforcement and regulation of the water industry in the State of Montana. Please take time to become familiar with this problem as it affects us all.

MWPCA PRESIDENT'S MESSAGE

*Barry E. Damschen, P.E.
President*

As President of the Montana Association of the Water Pollution Control Federation, I appreciate the opportunity to give the readers of the Big Sky Clearwater a summary of the activities of our organization. For those who are not familiar with our Association, WPCF is a national federation composed of operators, engineers, and local, state and federal officials primarily involved with wastewater collection and treatment systems and facilities. The National Federation has over 36,000 members worldwide.

In the Montana Association we currently have approximately 180 members. There are three categories of our membership; Active, Operations Division and Student. Over the past one year period 46 new members joined our Association indicating the high interest in the water pollution control field today.

The Association offers its membership several advantages and opportunities including:

- * The availability of over 100 various publications which specialize in various aspects of Water Quality Management at discounts up to 35%.
- * The opportunity to attend our state, regional and national conferences which includes technical sessions and equipment displays, and
- * The opportunity to tap the resources and expertise of the WPCF staff who provides technical and federal government policy information.

I especially welcome and invite all individuals involved in the water quality field to our State Conference to be held in Missoula on May 8, 9, and 10. This will allow our current and possible new members the opportunity to meet each other and discuss the problems and possible solutions that arise each day in our chosen profession. Through the 16 years that I have been a member of WPCF in Montana, I feel that the interaction that is received at the annual and regional meetings and conferences is one of the most important and beneficial aspects of the Association. I hope to see everyone at the conference in Missoula.

TO: Montana WPCA Members

FROM: Kristi Kline, Montana WPCA Director

We survived the 1990 WPCF annual conference in Washington, D.C. without the ground moving. Not even the government moved for a few days while we were there.

President Chuck Kaiser has given a high priority to the reauthorization of the Clean Water Act next year. He has set up a committee that will be responsible for developing WPCF's policy positions and recommendations for the Clean Water Act. Some of the issues include federal funding for the water quality programs, CSO controls and wetlands. This committee welcomes any comments or suggestions. Direct your comments to John Thorner, WPCF Government Affairs Director, 601 Wythe Street, Alexandria, VA 22314, phone (703) 684-2416.

The Name Change issue has been extended for one year to allow the membership further opportunity to submit additional names for consideration and review the entire issue. The idea behind changing our name deals with the importance of building a strong credibility with legislators and the public and avoiding the connotation that the Federation is a group of Water Pollution people. Some of the thoughts that are being addressed deal with finding a name that accurately conveys the nature of our organization; is easy to understand; and projects an image that we are knowledgeable and concerned with understanding and protecting the aquatic environment.

The current process allows for additional name suggestions to be sent in until January 31, 1991. Look for forms in Highlights, WE & T, and Operations Forum and in this issue of the Clearwater. Through the process Water Pollution Control Federation remains a name for consideration. The Name Change Task Force will review all names and narrow the list to one or possibly three and present their findings to the Executive Board. The Board of Control could vote on this issue at the October 1991 Board meeting. Member Association will not be required nor asked by the federation to change the name of their association if the Federation name changes. If you have any comments on this, contact me at 265-9031.

At the October 1990 meeting, the Board of Control voted in favor of increasing the Active membership dues \$10.00, from \$50.00 to \$60.00 and the PWOD membership dues \$12.50, from \$17.50 to \$30.00. Included in the PWOD increase would be a subscription to the Federation Highlights. This costs about \$5.00 per year per member, so the net increase for PWOD dues is \$7.50. This is the first membership dues increase for the Federation in four years. The increase resulted from an intensive study into the costs of programs and services provided to members in comparison to dues paid. Some of the new programs since 1986 are listed in this issue.

NAME CHANGE COMMENT FORM

To ensure that the Board of Control has the best alternatives before them in October 1991 when they choose between the name WPCF and a new name, please suggest any ideas you may have for a new name option they should consider. Some of the preferred names considered to date are listed below. Has a good name option been dropped? What do you think is the best option?

Water and Environmental Quality Federation - WEQF

Water and Environmental Management Federation - WEMF

Federation for Water and the Environment - FWE

Water Environment and Technology Federation - WETF

Environmental Water Quality Federation - EWQF

Water and Environment International - WEI

Environmental Management Federation - EMF

Environmental Quality Federation - EQF

Water Quality Protection Federation - WQPF

Water Environment Federation - WEF

COMMENTS/IDEAS

MAIL YOUR COMMENTS/IDEAS TO:

WPCF/NAME CHANGE
ATTN: PHYLLIS EASTMAN
601 WYTHE STREET
ALEXANDRIA, VA 22314

EXPANDED WPCF PROGRAMS SINCE 1986

Association Programs

- Regional Meetings*
- Staff visits to field*
- MA Connection Newsletter*
- MA Leaders Workshop*
- MA Workshops at Conference*
- Camera Ready Materials for MA Newsletters*

Technical/Education

- Wastewater Personnel Salary Survey*
- Video and revised Basic and Intermediate Courses*
- Education Strategy Plan - Education Committee*
- Safety Bulletin expanded format*
- 17 New MOPs*
- 7 New Special Publications*
- 17th Edition of Standard Methods*

Government Affairs

- Washington Briefing*
- More Testimony on Hill*
- More Regulatory Comments*
- Tours - Congressional and EPA staff*
- Washington Bulletin - more frequent*
- More Legislative and Regulatory Contacts*

Marketing/Membership

- Image of WPCF changed through new Logo and Motto*
- Redesign of all WPCF printed materials*
- Highlights in Tabloid Form*
- Products and Services Catalogue*
- Plastic Membership Cards*
- WPC Net*
- Student Chapter Formation*
- Membership Chairman Kit*
- Membership Workshops*
- MA Camera Ready Application*
- Quarterly Membership Reports*
- Membership "Top 10"*
- Specialty Items offering*
- Table Top Displays for MA Meetings*

Conference

- Exhibition grown from 339 booths and 84,100 net square feet to 484 booths and 133,660 net square feet in 1990 - an increase of 58 percent*
- Technical Sessions have grown from 51 to 66*
- Pre-Conference Workshops from 9 to 13*
- Attendance from 12,000 to 14,000*

NEW WPCF PROGRAMS SINCE 1986

Research Foundation

Water Quality 2000

Wolman Video Collection

Videotaping Federation History

Publications

Water Environment and Technology

Research Journal

Benchsheet

MA Exchange

Member-abilia

Convention Daily

Board Bulletin

Operations

Operations Challenge

Operators Day

Operators Job Bank

PROBE Modules:

Operating Activated Sludge

Using Oxygen Uptake

Useful Mathematics for

Making Activated Sludge

Process Control Decisions

Mathematics for Improving

Sludge Processing

Independent Study - TREEO

Biomonitoring Video

PWOD Representative Handbook

Public Education

6 New Brochures

School Curriculum:

*4 units (Wastewater; Groundwater;
Surface Water; Water Conservation)*

*Each unit has Video - Teacher and
Student Guide*

Careers Video - 2 Careers Brochures

Brochures

Technical Education

Hazardous Waste Program

Safety Video Program - 15 new videos

Annual Safety Video Festival

Membership/Marketing

Member Service Center

New Logo and Motto

Retired Member Category

Other

Specialty Conferences

1987-1, 1988-3, 1989-4,

1990-4, 1991-5, 1992-5

EPA Grants for:

Water Quality 2000

School Curriculum Videos

MOPs 8 and 11

VOC Conference and Publication

POTW Plant Performance

Problems Survey

International

*Expediting of publications
overseas*

Asia/Pacific Rim Steering

Committee

Trade and Development Program

Grant Activities

Aquatech Sponsorship

Dedicated Staff

REGULATORY UPDATE

DRINKING WATER

The Water Quality Bureau has recently completed draft VOC, Public Notification and Total Coliform Rules. These rules will be submitted to the Governor's Office for approval in the near future. After such review and approval, the Department will begin the formal rules adoption process with the intent of adopting the rules by late spring.

The Bureau has also prepared an agreement with EPA that outlines procedures for implementing federal regulations, such as the Surface Water Treatment Rule and Total Coliform Rule, until such time that State regulations are formally adopted.

As many of you are aware, this is the first wave of new federal regulations that must be adopted by the State. The federal schedule for rules adoption and implementation is shown below. Over the next few years the State will attempt to prepare State regulations in accordance with this schedule. Summaries outlining the basic provisions of some of these regulations follow.

SCHEDULE FOR ADOPTION OF DRINKING WATER REGULATIONS

<u>CONTAMINANT/REQUIREMENT</u>	<u>PROPOSED RULE</u>	<u>FINAL RULE*</u>	<u>EFFECTIVE DATE**</u>
PHASE I, VOLATILE ORGANICS	11/85	7/87	1/89***
PUBLIC NOTIFICATION	4/87	10/87	4/89***
SURFACE WATER TREATMENT	11/87	6/89	12/90****
TOTAL COLIFORM RULE	11/87	6/89	12/90****
LEAD/COPPER	8/88	12/90	6/92
PHASE II, 38 CONTAMINANTS	5/89	12/90	6/92
PHASE III, RADIONUCLIDES	3/91	12/92	6/94
PHASE IV, DISINFECTION	9/91	Spring 93	Fall 94
PHASE V, 24 CONTAMINANTS	6/90	3/92	9/93
PHASE VI, FIRST LIST	Fall 91	Mid 93	Winter 95
SECOND LIST	Winter 92	Winter 94	Mid 95

* All dates after November 1990 are estimated.

** EPA rules are generally effective 18 months after being finalized. State rules are required to be adopted by the EPA effective date.

*** State has adopted draft regulation. State did not meet EPA established effective date.

**** State has agreed to implement federal regulation. State plans to adopt State rules by December 1991.

TOTAL COLIFORM RULE

MONITORING AND REPORTING REQUIREMENTS

- o This regulation will impact all public water supplies in Montana.
- o All Montana public water supplies must begin meeting the monitoring and reporting requirements of this rule in January, 1991
- o The federal rule became final in June, 1989. The applicable federal reference is 40 CFR Parts 141 and 142.

Maximum Contaminant Level (MCL):

- o MCL for systems analyzing at least 40 samples/month: no more than 5.0 percent of the samples collected during a month may be total coliform-positive.
- o MCL for systems analyzing less than 40 samples/month: no more than 1 sample/month may be total coliform-positive.
- o Routine and repeat samples are included in this calculation. Special samples, such as those following pipe replacement or repair, will not be used for MCL determinations.

Monitoring Requirements for Total Coliforms

- o **SAMPLE SITING PLAN** - Each public water system must sample according to a written sample siting plan. Sample sites must be rotated throughout the distribution system. Plans are subject to State review and revision. The State will provide recommended procedures for siting plan development in early February, 1991.
- o **ROUTINE MONITORING** - Monitoring requirements are based on population served (see Table 1). All community public water supplies must monitor once per month as a minimum. Monthly monitoring has changed for systems serving over 9,400 population. Refer to Table 1 and notify the certified lab performing your analyses if your monitoring frequency has changed.

If your system serves over 4,900, routine samples must be collected at regular time intervals throughout the month. If your system serves 4,900 or fewer you may collect all of the samples on the same day, but they must be at different sample sites.

- o **REPEAT SAMPLES** - If a routine sample is total coliform-positive, the you must submit a set of repeat samples within 24 hours of being notified of the positive result (see Table 2). At least one repeat sample must be from the same tap as the original sample; other repeat samples must be collected from within five service connections both upstream and downstream of the original sample. Systems required to collect 4 repeat samples may collect the 4th sample from anywhere in the distribution system. Difficulties with these repeat sampling locations must be worked-out with the State on a case-by-case basis. The State may waive the 24 hour-requirement on a case-by-case basis.
- o All repeat samples must be collected on the same day, except the State may allow a system with a single service connection to collect the required set of repeat samples over a four-day period. Unless otherwise authorized by the State, systems with a single service connection should collect all repeat samples the same day, even if this means they are all collected from the same tap in rapid succession.

If total coliforms are detected in any repeat sample, the system must collect another set of repeat samples, as before, unless the MCL has been violated and the system has notified the State (in which case the State may reduce or eliminate the repeat sampling requirement for the remainder of the month).

o **ROUTINE SAMPLES REQUIRED FOLLOWING TOTAL COLIFORM DETECTION** - If a system which collects fewer than five routine samples/month detects total coliforms in any routine or repeat sample, it must collect a set of five routine samples the next month the system provides water to the public. These samples are required in addition to any repeat samples being collected for a previous total coliform-positive sample.

Fecal Coliforms/E. coli; Heterotrophic Bacteria (HPC)

o **FECAL COLIFORM ANALYSIS** - If any routine or repeat sample is total coliform-positive, that total coliform-positive culture must be analyzed to determine if fecal coliforms are present. E. coli may be tested for instead of fecal coliforms. If fecal coliforms or E. coli are detected, the system must notify the State before the end of the same business day, or, if detected after the close of business for the State, by the end of the next business day.

If any repeat sample is fecal coliform- or E. coli-positive, or if a fecal coliform- or E. coli-positive original sample is followed by a total coliform-positive repeat sample, the system is in violation of the MCL for total coliforms. This is an acute violation of the MCL for total coliforms.

o **IF YOU DON'T ANALYZE A TOTAL COLIFORM-POSITIVE SAMPLE FOR FECAL COLIFORMS OR E. COLI** - On a case-by-case basis, a water system can forgo fecal coliform or E. coli testing on total coliform-positive samples, if the system treats every total coliform-positive sample as if it contained fecal coliforms, i.e., the system complies with all sections of the rule which apply when a sample is fecal coliform-positive.

o **HETEROTROPHIC BACTERIA** - If the laboratory finds that heterotrophic bacteria interfered with total coliform analysis, the system must collect another sample within 24 hours of being notified of the result. The sample must be collected from the same location as the original sample and be analyzed for total coliforms.

**TABLE 1: Total Coliform Sampling Requirements
According to Population Served**

Population Served	Minimum Number of Routine Samples Per Month	Population Served	Minimum Number of Routine Samples Per Month
25 to 1,000	1	17,201 to 21,500	20
1,001 to 2,500	2	21,501 to 25,000	25
2,501 to 3,300	3	25,001 to 33,000	30
3,301 to 4,100	4	33,001 to 41,000	40
4,101 to 4,900	5	41,001 to 50,000	50
4,901 to 5,800	6	50,001 to 59,000	60
5,801 to 6,700	7	59,001 to 70,000	70
6,701 to 7,600	8	70,001 to 83,000	80
7,601 to 8,500	9	83,001 to 96,000	90
8,501 to 12,900	10	96,001 to 130,000	100
12,901 to 17,200	15		

-> A non-community water system using only ground water and serving 1,000 persons or fewer must monitor each calendar quarter that the system serves water to the public.

-> A non-community water system serving more than 1,000 persons during any month must monitor according to the frequency defined in Table 1.

-> All public water supplies using surface water, or groundwater under the direct influence of surface water, regardless of the number of persons served, must monitor at the same frequency as specified in Table 1. Refer to the Surface Water Treatment Rule summary for a definition of 'groundwater under the direct influence of surface water' and additional surface water sampling requirements.

TABLE 2: Monitoring and Repeat Sample Frequency
After a Total Coliform-Positive Routine Sample

<u>No. Routine Samples/Month</u>	<u>No. Repeat Samples</u>	<u>No. Routine Samples Next Month</u>
1/mo or fewer	4	5/mo
2/mo	3	5/mo
3/mo	3	5/mo
4/mo	3	5/mo
5/mo or greater	3	Table 1

Variances and Exemptions: None allowed

Analytical Methodology

Total coliform analyses are to be conducted using the 10-tube MTF Technique, the MF Technique, the P-A Coliform Test or the Minimal Media ONPG-MUG Test (Autoanalysis Colilert System). The system may also use the 5-tube MTF Technique (20-ml sample portions) or a single culture bottle containing the MTF medium, as long as a 100-ml water sample is used in the analysis.

Public Notice Requirements

o Violations of the MCL when total coliforms, fecal coliforms or E. coli are present requires that specific wording be used for public notice. Public notice is also mandated if a system fails to monitor as required. The federal rules also detail how, when, and at what frequency notice must be provided. Different violations have different requirements, based on their potential impact on public health. Contact the State Health Department for assistance when public notice is required.

The following is a checklist of notice contents:

- o The notice provides a clear and readily understandable explanation of the...
 - * the nature of the violation/action
 - * mandatory health effects language
 - * population at risk
 - * steps the system is taking to correct the violation
 - * necessity of seeking alternative water supplies (if any)
 - * preventive measures the consumer should take until the violation is corrected.
- o The notice ...
 - * is clear and conspicuous in design
 - * contains non-technical language
 - * uses print that is easy to read
 - * content creates no problems that would frustrate the purpose of public notification
 - * contains the telephone number of the owner, operator, or designee of the public water system as a source of additional information
 - * contains multi-lingual language, where appropriate

SUMMARY OF THE REGULATIONS SURFACE WATER TREATMENT REQUIREMENTS

- o This regulation applies to all public water supplies using surface water, or "groundwater under the direct influence of surface water".
- o Monitoring and reporting required by these regulations depends on the type of surface water supply used and the treatment applied.
- o The federal rule became final in June, 1989. The effective date of this rule is December 30, 1990. The applicable federal reference is 40 CFR Parts 141 and 142.

General Requirements

- o **COVERAGE** - All public water systems using any surface water or ground water under direct influence of surface water must disinfect, and may be required to filter, unless certain source water quality requirements and site specific conditions are met.
- o **MAXIMUM CONTAMINANT LEVELS (MCLS)** - Treatment technique requirements are established instead of MCLs for Giardia, viruses, heterotrophic plate count bacteria, Legionella and turbidity.
- o **TREATMENT REQUIREMENTS** - Treatment must achieve at least 99.9 percent removal and/or inactivation of Giardia lamblia cysts and 99.99 percent removal and/or inactivation of viruses.
- o **CERTIFIED OPERATORS** - All surface water supplies must be operated by qualified operators as determined by the State. This means the State will be developing requirements for each surface water system to have a certified operator in responsible charge of the public water supply. This applies to community, non-community, and non-transient non-community water supplies.

Compliance

- o **UNFILTERED SURFACE WATER SYSTEMS** - Unfiltered systems must meet monitoring requirements beginning January 1, 1991, unless the State has determined that filtration is required. Unfiltered systems must meet the criteria to avoid filtration beginning January 1, 1992 unless the State has determined that filtration is required, or they are in violation of a treatment technique

requirement. Unfiltered systems must install filtration within 18 months following the failure to meet any one of the criteria to avoid filtration or by June 29, 1993, whichever is later, or they are in violation.

- o **FILTERED SURFACE WATER SYSTEMS** - Filtered systems must meet monitoring and performance requirements beginning June 29, 1993.
- o **TURBIDITY** - The interim turbidity monitoring and MCL requirements will remain in effect for unfiltered systems until January 1, 1992 and for filtered systems until June 29, 1993. For systems which prior to January 1, 1992 the State determines must filter, the interim turbidity requirements will remain in effect until June 29, 1993, or until filtration is installed, whichever is later.
- o **UNFILTERED SYSTEMS UNDER THE DIRECT INFLUENCE OF SURFACE WATER** - Unfiltered systems under the direct influence of surface water must begin monitoring within 6 months following the determination of direct influence unless the State has determined that filtration is required. Systems under direct influence of surface water must begin meeting the criteria to avoid filtration 18 months after the determination of direct influence, unless the State has determined that filtration is required. Unfiltered systems under direct influence of surface water must install filtration within 18 months following the failure to meet any of the criteria to avoid filtration.

This interim period before turbidity regulations change for your system should be used to solve problems which might prevent compliance with the new requirements. After the June 29, 1993 date, the new turbidity and monitoring requirements will be enforced.

Groundwater Under The Direct Influence Of Surface Water

- o **DEFINED** - Any water beneath the surface of the ground with (i) significant occurrence of insects or other macroorganisms, algae, or large-diameter pathogens such as Giardia lamblia, or (ii) significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions.

Simply put, if a ground water is subject to Giardia contamination, it would be classified as under the direct influence of surface water. Direct influence must be determined for individual sources in accordance with criteria established by the State. The State determination of direct influence may be based on an evaluation of site-specific measurements of water quality and/or well construction characteristics and geology with field evaluation.

- o **TIMETABLE** - The federal rule allows the State until June, 1994 to determine if community water supplies meet this definition; and until June, 1999 for non-community water supplies. If a source is found to be under the direct influence of surface water, monitoring must begin 6 months after the determination to demonstrate they are meeting the criteria to avoid filtration. It must comply with the requirements to avoid filtration beginning 18 months after the determination is made.
- o **AFFECTED SYSTEMS** - Shallow wells, wells adjacent to surface water, springs, and infiltration galleries will be the priority systems for the State to evaluate first. New systems and systems under renovation can expect to be evaluated for possible direct influence by surface water.
- o **PREPARING FOR SYSTEM EVALUATION** - Water suppliers will be expected to provide construction information, monitoring data and possibly hydrogeological studies to document they are meeting the criteria to avoid filtration. Systems can prepare for this evaluation by obtaining data on the following:
 - * construction details for the collection system and soils profile for the area
 - * hydrogeological study of the recharge area
 - * water characteristics as included in the definition
 - * daily source water flow measurements and data on precipitation events and surface water flow
 - * any other information pertinent to the origin of the water and possible filtration provided by the overlying soils or aquifer.

Criteria to be Met to Avoid Filtration

- o **SOURCE WATER QUALITY CRITERIA - COLIFORMS** - Minimum requirements for bacteriological quality must be met to show the source water is of adequate quality to be used without filtration. Samples must be collected from the raw water before disinfection. Fecal coliforms must not exceed 20/100 ml or total coliforms must not exceed 100/100 ml in more than ten percent of the measurements for the previous six months, calculated each month.

The coliform samples must be collected on separate days. Minimum sampling frequencies for the coliform determinations are:

<u>Population served</u>	<u>Samples/Week</u>
less than 501	1
501 - 3,300	2
3,301 - 10,000	3
10,001 - 25,00	4
over 25,00	5

If not already conducted under the above requirements, a coliform test must be made each day that the turbidity exceeds 1 NTU.

- o **SOURCE WATER QUALITY CRITERIA - TURBIDITY** - Turbidity levels must be measured prior to the first or only point of disinfection. Sample frequency is every four hours by grab sample or continuous monitoring. The turbidity level may not exceed 5 NTU. If the turbidity exceeds 5 NTU, the system must install filtration unless the State determines that the event is unusual or unpredictable and the event does not occur more than two periods in any one year, or five times in any consecutive ten years. An "event" is one or more consecutive days when at least one turbidity measurement each day exceeds 5 NTU. Spring runoff would not be considered an unpredictable event.
- o **WATERSHED CONTROL PROGRAM** - Systems must maintain a watershed control program which will minimize the potential for contamination by human enteric viruses and Giardia lamblia cysts in the source water. The State must determine whether the watershed control program is adequate to meet this goal. Systems must monitor and control the activities in the watershed that may have an adverse impact on water. Systems must demonstrate through ownership or written agreements with landowners in the watershed that they are able to limit and control all human activities that may have an adverse impact upon water quality. The watershed control program and disinfection treatment must be inspected on-site and approved by the State annually.
- o **WATERBORNE DISEASE OUTBREAKS** - Systems must not have had any waterborne disease outbreaks, or if they have, such systems must be modified to prevent another such occurrence, as determined by the State.
- o **COMPLIANCE WITH THE TOTAL COLIFORM RULE** - Systems must not be out of compliance with the monthly MCL for total coliforms for any two months in any consecutive 12 month period, unless the State determines that the violations are not due to treatment deficiency of the source water.
- o **TRIHALOMETHANES** - Systems serving more than 10,000 people must be in compliance with MCL requirements for total trihalomethanes.

- o **SITE-SPECIFIC CONDITIONS - DISINFECTION** - Disinfection must achieve at least a 99.9 and 99.99 percent inactivation of Giardia cysts and viruses, respectively. This must be demonstrated by the system meeting "CT" values in the rule ["CT" is the product of residual concentration (mg/l) and contact time (minutes) measured at peak hourly flow]. "C" and "T" must be determined at or prior to the first customer. Failure to meet this requirement on more than one day in a month is a violation. Filtration is required if a system has two or more violations in a year, unless the State determines that at least one of these violations was caused by circumstances that were unusual and unpredictable. A third violation in 12 months, regardless of the cause, triggers filtration. CT tables are available by contacting the Water Quality Bureau at 444-4549.
- o **SITE SPECIFIC CONDITIONS - DISINFECTION SYSTEM COMPONENTS** - Disinfection systems must a) have redundant components including alternate power supply, automatic alarm and start-up to ensure continuous disinfection of the water during plant operation or b) have automatic shut-off of delivery of water to the distribution system whenever the disinfectant residual is less than 0.2 mg/l, provided that the State determines that a shut-off would not pose a potential health risk to the system.
- o **SITE SPECIFIC CONDITIONS - DISTRIBUTION SYSTEM DISINFECTANT RESIDUAL** - Disinfectant residuals in the distribution system cannot be undetectable in more than five percent of the samples, each month, for any two consecutive months. Samples must be taken at the same frequency as total coliforms under the revised coliform rule (see the Total Coliform Rule Summary, Table 1). A system may measure for HPC in lieu of disinfectant residual. If the HPC measurement is less than 500 colonies/ml, the site is considered to have a "detectable" residual for compliance purposes. Systems in violation of this requirement must install filtration unless the State determines that the violation is not caused by a deficiency of treatment of the source water. For systems which cannot maintain a residual or practically monitor for HPC, the State can judge whether adequate disinfection is provided in the distribution system.
- o **SITE SPECIFIC CONDITIONS - DISINFECTANT RESIDUAL ENTERING THE SYSTEM** - Systems must maintain a disinfectant residual concentration of at least 0.2 mg/l in the water entering the system, demonstrated by continuous monitoring. Substitute grab sample monitoring may replace continuous monitoring for up to 5 days if samples are collected every four hours. If the disinfectant residual falls below 0.2 mg/l, the system must notify the State as soon as possible but no later than the end of the next business day; notification must include whether or not the residual was restored within four hours. If the residual is not restored to at least 0.2 mg/l within four hours, it is a violation and the system must filter. Systems serving 3,300 people or less can take daily grab samples in lieu of continuous monitoring. Minimum grab

sampling frequencies are: 1/day, 501 people; 2/day 501-1,000; 3/day 1,100-2,500; 4/day 2,501-3,300. If at any time the residual is below 0.2 mg/l, the system must conduct grab sample monitoring every four hours until the residual is restored.

Criteria for Filtered Systems

- o **TURBIDITY MONITORING** - Turbidity must be measured every four hours by grab sample or continuous monitoring. For systems using slow sand filtration or filtration technologies other than conventional treatment, direct filtration or diatomaceous earth filtration, the State may reduce the sample frequency to once per day. The State may reduce monitoring to one grab sample per day for all systems serving less than 500 people.

- o **TURBIDITY MAXIMUM CONTAMINANT LEVELS (MCLS)**

Conventional filtration or direct filtration water must achieve a turbidity level in the filtered water at all times less than 5 NTU and not more than 0.5 NTU in more than five percent of the measurements taken each month.

Slow sand filtration must achieve a turbidity level in the filtered water at all times less than 5 NTU and not more than 1 NTU in more than five percent of the samples taken each month. The turbidity limit of 1 NTU may be increased by the State (but at no time exceed 5 NTU) if it determines that there is no significant interference with disinfection.

Diatomaceous earth filtration must achieve a turbidity level in the filtered water at all times less than 5 NTU and of not more than 1 NTU in more than five percent of the samples taken each month.

Other filtration technologies may be used if the system demonstrates to the State that they achieve at least 99.9 and 99.99 percent removal/ inactivation of Giardia lamblia cysts and viruses, respectively, and are approved by the State. Turbidity limits for these technologies are the same as those for slow sand filtration, including the allowance of increasing the turbidity limit of 1 NTU up to 5 NTU, but at no time exceeding 5 NTU upon approval by the State.

- o **DISINFECTION REQUIREMENTS** - Disinfection with filtration must achieve at least 99.9 and 99.99 percent removal/ inactivation of Giardia cysts and viruses, respectively. The State defines the level of disinfection required, depending on technology, staffing of the plant during periods of operation, and source water quality. Guidance on the use of CT values to make these determinations is available in the Guidance Manual (contact the Safe Drinking Water Act Hotline at 800-426-4791 to arrange to obtain a copy).

Recommended levels of inactivation are based on expected occurrence levels of Giardia cysts in the source water and the filtration technology in place. Disinfection requirements for point of entry to the distribution system and within the distribution system are the same as for unfiltered systems.

Analytical Requirements

Except for ozone, testing and sampling must be in accordance with Standard Methods, 16th edition, or methods approved by EPA for total coliforms, fecal coliforms, turbidity, disinfectant residuals, temperature and pH. Residual disinfectant concentrations for ozone must be measured by the Indigo Method or automated methods which are calibrated in reference to the results obtained by the Indigo Method.

Reporting

All parameters required in the rule must be reported monthly to the State, by the 10th of the month following that during which the data was collected. Unfiltered water systems must also report annually on their watershed control program and on-site inspections.

Variances and Exemptions

- * Variances are not applicable.
- * Exemptions are allowed for the requirement to filter. Systems using surface water must disinfect (i.e., no exemptions). Exemptions are allowed for the level of disinfection required.

Volatile Organic Chemicals (VOCs)/Unregulated Contaminants

SUMMARY SHEET

Definitions

Public Water System - A system for the provision to the public of piped water for human consumption, if such system has at least 10 service connections or regularly serves an average of at least 25 persons daily at least 60 days out of the calendar year. Such term includes 1) any collection, treatment, storage and distribution facilities under control of the operator of such systems and used primarily in connection with such system, and 2) any collection, pre-treatment or storage facilities not under such control which are used primarily in connection with such system.

Community Water System - A public water supply which serves at least 10 service connections used by year-round residents or regularly serves at least 25 year-round residents. Examples are municipal, subdivision or mobile home park water systems serving 25 or more residents.

Non-Community Water System - A public water supply that is not a community water system. Examples are separate systems serving transient non-residential populations of 25 or more persons per day, such as restaurants, campgrounds or resorts.

Non-Transient Non-Community Water System - A public water system that is not a community water system and that regularly serves at least 25 of the same persons for more than 6 months per year. Examples are separate systems serving workers and schools.

Maximum Contaminant Level Goal (MCLG) - For each regulated contaminant, a level to be established at which no known or anticipated adverse effects on the health of persons occur and which allows an adequate margin of safety.

Maximum Contaminant Level (MCL) - The maximum permissible level of a contaminant in water which is delivered to any user of a public water system. As defined in the Safe Drinking Water Act, the MCL is to be established as close to the MCLG as is feasible.

VOLATILE SYNTHETIC ORGANIC CHEMICALS (VOCs); SAMPLING FOR UNREGULATED CONTAMINANTS

- o States must adopt standards at least as strict as the federal requirements.
 - o All community and only non-transient non-community (NTNC) water systems are subject to these regulations.
 - o July 8, 1987 Federal Register listed MCLs, MCLGs and monitoring requirements for 8 volatile organic chemicals (VOCs) and monitoring requirements for 51 unregulated contaminants. Sampling requirements are effective January 1, 1988 with phase-in by system population. MCLs are effective January 9, 1989 for all systems.
-

VOCs Final MCLGs and MCLs

micrograms per liter (ug/l)

	Final MCLG	Final <u>MCL</u>
Trichloroethylene	0	5
Carbon tetrachloride	0	5
Vinyl chloride	0	2
1,2-Dichloroethane	0	5
Benzene	0	5
para-Dichlorobenzene	75	75
1,1-Dichloroethylene	7	7
1,1,1-Trichloroethane	200	200

- o Since vinyl chloride is most often a product of the breakdown of other chemicals, analysis for vinyl chloride is only required by groundwater systems, after one or more chlorinated two-carbon, VOCs are found. Trichloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane and 1,1 dichloroehtylene are such two-carbon chemicals.
- o The monitoring requirements are phased-in by population served by the system.
- o All systems must sample once within 4 years.

Population

Over 10,000
3,300 to 10,000
Less than 3,300

Sampling must begin by

January-March 1988 quarter
January-March 1989 quarter
January-March 1991 quarter

VULNERABILITY

- o The vulnerability of a system will be assessed by the State using the following criteria:
 - 1) Population in the area of the PWS;
 - 2) Nearby use of VOCs;
 - 3) Protection of the water source.
- o Vulnerability assessments will occur every 3 years for systems greater than 500 service connections. Systems will less than 500 service connections will be assessed every 5 years.

SAMPLING FREQUENCY

- o Repeat sampling is based on the first sampling results and vulnerability to contamination. Repeat samples will be collected as frequently as quarterly and at a minimum of once every five years.
- o If, upon initial sampling, results show:

	<u>Ground Water (GW)</u>	<u>Surface Water (SW)</u>
1. VOC not detected. Source not vulnerable.	Repeat every 5 years	State Decision after 4 quarters
2. VOC not detected. Source is vulnerable.		
a. Systems with greater than 500 service connections	Repeat every 3 years	Repeat every 3 years
b. Systems with less than or equal to 500 connections	Repeat every 5 years	Repeat every 5 years
3. VOCs detected	Quarterly	Quarterly

- o The State can choose to require sampling for only one quarter for a system using only ground water which had no VOCs detected in sampling for that first quarter.

o Sampling Locations and Number of Samples

Ground water systems should collect a sample at each point of entry into the distribution system. Samples should represent each ground water source and be collected after any treatment.

- o For systems using multiple sources, compositing of up to 5 samples is allowed. Samples will be composited in the laboratory. If VOCs are detected in a composite sample, follow-up sampling is required at each entry point included in the composite. Composite samples must be collected on the same day and analyzed in 14 days.

Surface water systems can sample at points in the distribution system where a sample can be obtained that is representative of each source and after any treatment has been applied. The samples are best collected where water leaves the treatment plant.

In the case where several sources are blended at one point, a sample should be collected at a point after blending and before introduction to the distribution system.

Unregulated Contaminants

Systems are required to sample each drinking water source once for unregulated contaminants, during the 4-year period. The same phase-in schedule as the 9 VOCs applies. Systems with less than 150 service connections can fulfill their monitoring requirements by submitting a letter to the State, notifying them that they are available for sampling.

- o Fifty-one contaminants are divided into 3 lists:
 - List 1 required for all systems (34 organic chemicals)
 - List 2 required for vulnerable systems (2 organic chemicals)
 - List 3 required at State discretion (15 organic chemicals)

- o Note: Vulnerability will be defined by the State or EPA

List 1: Monitoring Required
for All Systems

Bromobenzene
 Bromodichloromethane
 Bromoform
 Bromomethane
 Chlorobenzene
 Chlorodibromomethane
 Chloroethane
 Chloroform
 Chloromethane
 o-Chlorotoluene
 p-Chlorotoluene
 Dibromomethane
 m-Dichlorobenzene
 o-Dichlorobenzene
 trans-1,2 Dichloroethylene
 cis-1,2-Dichloroethylene
 Dichloromethane
 1,1-Dichloroethane
 1,1-Dichloropropane
 1,2-Dichloropropane
 1,3-Dichloropropane
 1,3-Dichloropropene
 2,2-Dichloropropane
 Ethylbenzene
 Styrene
 1,1,2-Trichloroethane
 1,1,1,2-Tetrachloroethane
 1,1,2,2-Tetrachloroethane
 Tetrachloroethylene
 1,2,3-Trichloropropane
 Toluene
 p-Xylene
 o-Xylene
 m-Xylene

List 2: Monitoring Required
for Vulnerable Systems

Ethylene dibromide (EDB)
 1,2-Dibromo-3-chloropropane(DBCP)

List 3: Monitoring Required
at the State's Discretion

Bromochloromethane
 n-Butylbenzene
 Dichlorodifluoromethane
 Fluorotrichloroemthane
 Hexachlorobutadiene
 Isopropylbenzene
 p-Isopropyltoluene
 Naphthalene
 n-Propylbenzene
 Sec-butylbenzene
 Tert-butylbenzene
 1,2,3-Trichlorobenzene
 1,2,4-Trichlorobenzene
 1,2,4-Trimethylbenzene
 1,3,5-Trimethylbenzene

VOC SAMPLING PROCEDURES

The following are general procedures for sampling for VOCs and unregulated contaminants. It is important that the sampler discuss sampling procedures with the laboratory conducting the analysis. These sampling procedures assume that a preservative has been added to the sampling vials.

1. Fill in label completely with all relevant data (it is best to use a "waterproof" pen or marker).
2. Turn water on, let run for at least 5 minutes.
3. Fill vial slowly, being careful not to wash out the preservative in spiked vials.
4. Fill to the very top of the vial.
5. Fill the vial until there is a curved layer of water (sometimes called a meniscus) slightly above the rim of the vial.
6. All containers are capped with a teflon-lined septum. Place septum in the retainer ring (cap) so that when placed on the sample vial, the shiny side of the teflon will be in contact with the sample.
7. Tightly screw on lid.
8. It is very important that no air be trapped in the sample. To check sample, invert vial and tap the top. If an air bubble rises to the surface, do not empty contents. Emptying contents will also empty preservative. Remove cap and add enough water to displace air. Recap and make a final check of the sample.
9. Samples should be refrigerated and must be analyzed within 14 days if a preservative has been used. Again, check with the laboratory doing the analysis.
10. Only laboratories certified by the State for VOC analysis can be used to determine compliance with the VOC regulations.

CERTIFIED LABS FOR VOC TESTING

Energy Laboratories, Box 30916, Billings 59107
(Phone 800-873-5227)

Department of Health and Environmental Sciences
Chemistry Lab
Cogswell Building
Helena, MT 59620
(Phone 444-3444)

MATH REVIEW FOR CERTIFICATION EXAM

Sponsored by

WATER QUALITY BUREAU

March 8, 1991

7:00 p.m.

- | | |
|---|---|
| 1. HAVRE
Northern Montana College
Room 104
Hagener Science Center | 2. MILES CITY
Miles Community College
Room 106
2715 Dickinson |
| 3. HELENA
Cogswell Building
Room C-209 - Side 2
(Use Broadway entrance) | 4. GREAT FALLS
NMC Great Falls Center
Room 102
1211 NW Bypass |
| 5. MISSOULA
Liberal Arts Building
Room 102
University of Montana | 6. KALISPELL
Business/Social Science Building
Room 132
Flathead Valley Community College
777 Grandview Dr. (Whitefish Hwy.) |
| 7. BILLINGS
Wastewater Treatment Plant
Administration Building Conference Room
(Entrance to plant is just west of
Highway 87 east bridge) | |

* * * * *

This session is intended to review basic math with those people taking the certification exam on March 9, 1991. The review will begin at 7:00 p.m.

NOTE: The location for the Billings review session is not the same as for the certification exam.

For more information call: Rosemary Fossum, Water Quality Bureau, 444-2691.

EXAMINATION NOTICE

ON SATURDAY—MARCH 9, 1991—9:30 A.M.

Examinations for certification as a Water Distribution System Operator, Water Plant Operator and Wastewater Plant Operator will be given at these seven locations:

BILLINGS----- Room 527; Liberal Arts Bldg.(tallest building on campus); EMC

GREAT FALLS-- Rm. 102; NMC Great Falls Center; 1211 NW Bypass (8 blocks W. of Shopko)

HAVRE----- Room 103-4; Hagener Science Center; Northern Montana College

HELENA----- Room C209-Side 2; Cogswell Building; (Use entrance from Broadway)

KALISPELL---- Rm. 132; Bus./Soc.Sci Bldg.; Flathead Valley College; 777 Grandview Dr.

MILES CITY--- Room 106; Miles Community College; 2715 Dickinson; East of Vet's Hosp.

MISSOULA----- Room 102; Liberal Arts Building; University of Montana

By February 22, as required by ARM 16.18.204, everyone taking examinations must have:

- completed an application for certification as a water/wastewater operator.
- paid application (or renewal) fees for fiscal year 91 which ends 6/30/91.
- submitted examination registration slips and fees of \$5 per examination.

APPLICATION FEES ARE: Class 1-\$27; Class 2-\$22; Class 3-\$17; Class 4-\$12; Class 5-\$10

To request application materials, order study materials, or ask for additional information call the certification office at 444-2691 or write: DHES-WATER QUALITY BUREAU;Water/Wastewater Operator Certification; Room A206, Cogswell Building, Helena, Mt. 59620. RETAIN THE UPPER PORTION OF THIS NOTICE, PLEASE.

EXAMINATION REGISTRATION SLIP

(Detach and return with \$5 per examination by 2/22/91)

I will take the examination(s) I have checked below at: ___Billings; ___Great Falls; ___Havre;
___Helena; ___Kalispell; ___Miles City; ___Missoula

	1	2	3	4	5
A--Water Distribution	_____	_____	_____	_____	
B--Water Plant	_____	_____	_____	_____	_____
C--Wastewater Plant	_____	_____	_____	_____	

*Combination examination 2A3B, 3A4B, 4A4B, and 5A5B require \$5 exam fee only.

NAME _____ ADDRESS _____ SYSTEM _____



AMERICAN WATER WORKS ASSOCIATION INDIVIDUAL MEMBERSHIP APPLICATION

Complete this form and mail to:
AWWA / 6666 W. Quincy Avenue / Denver, CO 80235
(303) 794-7711 • FAX (303) 794-7310

AWWA USE ONLY

PLEASE PRINT OR TYPE

Last Name		First Name (and middle initial)	
Mailing Address			
City		State/Province	ZIP/Postal Code
Area Code	Telephone	Area Code	FAX
Title			
Employer's Name (If not already in mailing address)			
Applicant's Signature		Date	

Signature of AWWA Member Endorsing Application (Optional)	Endorsing Member Number
---	-------------------------

ANNUAL DUES:

\$65/Active
Grade Code 02

\$30/Affiliate
Grade Code 06
(For operator level personnel or
employees of small utilities)

\$22/Student
Grade Code 14
(Must be enrolled and carrying at least
10 credit hours)

ANNUAL DUES	\$	
New England Assessment*		
Multi-Section Option (other than own)		
TOTAL DUE	\$	

If you have been a member of AWWA before, indicate
dates here:

Make check payable to AWWA (Canadian funds add 20%).

<input type="checkbox"/> MasterCard	<input type="checkbox"/> VISA	<input type="checkbox"/> Diner's Club
<input type="checkbox"/> American Express	<input type="checkbox"/> Send Invoice	

Card Number

Expiration Date

PREPAYMENT OF ONE YEAR'S DUES REQUIRED
No action can be taken on this application until payment is received.

*Applicants with an address in the New England Water Works
Association a Section of AWWA (ME, NH, RI, VT, MA) must add
\$32.00 for Active Membership, or \$15.00 for Affiliate Membership
in their annual dues.

Address shown above is:
Check One: ☐ Home ☐ Office

MULTI-SECTION MEMBERSHIP

At this time you may also select a
year's membership in other AWWA
sections by circling your choices and
include \$12 for each section circled.
Enter this total on the line reading
"multi-section."

CIRCLE SECTION CHOICES

AKA	ALASKA	IWA	IOWA	PAC	PACIFIC NORTHWEST (OR, WA, PART OF ID)
ALA	ALABAMA-MISSISSIPPI	KAN	KANSAS	PEN	PENNSYLVANIA
ARI	ARIZONA	KNT	KENTUCKY-TENNESSEE	PRT	PUERTO RICO
ATC	ATLANTIC-CANADA (NB, NF, NS, PEI)	MEX	MEXICO	QUE	QUEBEC
BRC	BRITISH COLUMBIA (BC, YT)	MIC	MICHIGAN	RMT	ROCKY MOUNTAIN (CO, NM, WY)
CAL	CALIFORNIA-NEVADA	MOU	MISSOURI	SCR	SOUTH CAROLINA
CHS	CHESAPEAKE (DE, DC, MD)	MTN	MONTANA	SDK	SOUTH DAKOTA
CON	CONNECTICUT	NEB	NEBRASKA	SOW	SOUTHWEST (AR, LA, OK)
FLA	FLORIDA	*NEW	NEW ENGLAND (ME, NH, RI, VT, MA)	TEX	TEXAS
GEO	GEORGIA	NEJ	NEW JERSEY	VIR	VIRGINIA
HWI	HAWAII (GUAM)	NEY	NEW YORK	WEC	WESTERN CANADA (AB, MB, NT, SK)
ILL	ILLINOIS	NOC	NORTH CAROLINA	WEV	WEST VIRGINIA
IND	INDIANA	NOL	NORTH CENTRAL (MN, ND)	WIS	WISCONSIN
INT	INTERMOUNTAIN (UT, PART OF ID)	OHO	OHIO		
		ONT	ONTARIO		

*IF "NEW" ENGLAND IS A CHOICE, add \$44.00.
This includes their assessment and multi-section fee.

ALL APPLICANTS SHOULD COMPLETE THIS SECTION:

Circle the descriptions below that best describe you. The information is used in audits of AWWA readership.
Circle only ONE in each group.

BUSINESS AND INDUSTRY

- A. Public Water Supply Utility—Municipally Owned
- B. Public Water Supply Utility—Investor Owned
- C. Governmental—Federal, State, Local
- D. Consultant
- E. Contractor
- F. Private Industrial Systems or Water Wholesaler
- G. Manufacturer of Equipment & Supplies including
Representatives
- H. Distributors of Equipment & Supplies including
Representatives
- I. Educational Institutions, Faculty and Students, Libraries,
and Other Related Organizations
- J. Fully Retired
- K. Research Lab
- L. Unreported

JOB TITLE

- A. Executive-Gen'l Mgr., Commissioner, Board Member,
City Mgr., Mayor, President, Vice-President, Owner,
Partner, Director, etc.
- B. Management-Division Head, Section Head, Mgr., Chief
Engineer, Comptroller, etc.
- C. Engineering/non-managerial-Civil Engr., Mech. Engr.,
Envir. Engr., Planning Mgr., Field Engr., System
Designer, etc.
- D. Scientific/non-managerial-Chemist, Biologist,
Biophysicist, Researcher, Analyst, etc.
- E. Purchasing-Purchasing Agent, Procurement
Specialist, Buyer, etc.
- F. Operations-Foreman, Operator, Maintenance,
Crewman, Service Rep., etc.
- G. Marketing & Sales/non-managerial-Mkt. Analyst,
Mkt. Rep., Salesman, Sales Rep., etc.
- H. Other (describe)

CHECK FIELD(S) SERVED:

- 5 ☐ Water Supply Only
- 7 ☐ Wastewater Only
- 9 ☐ Both
- 3 ☐ Other

In some AWWA sections, a portion of the section allotment
equal to 50 percent or more of the domestic subscription
rate charged for the section periodical will be allocated
toward a subscription of that periodical.

Dues allocated for each publication
members receive:

Journal \$28
MainStream \$6
Opflow \$5
Waterworld News \$5

Membership Application

Water Pollution Control Federation

601 Wythe Street
Alexandria, Virginia 22314-1994

Association

Montana Water Pollution Control Association

Use this application to join the Water Pollution Control Federation and your local Member Association. Simply complete this application and return it to the address

below. Along with your monthly publications, you are also entitled to group insurance, technical assistance, discount on technical publications, and much more!

Please print.

First Name, Middle Initial (11)

Last Name (16)

(Jr., Sr., etc.) (3)

Mailing address ☐ Business or ☐ Home

Business Name (if applicable) (30)

Street or P.O. Box (30)

City (20) State (2) Zip Code (9)

Area Code—Telephone (10) Country (If Outside U.S.) (16)

WPCF Sponsor (Not Required)

Sponsor's Member I.D. Number

Employer Code (2)

11 - Local/Regional Government/Agency
13 - State/Interstate Government/Agency
16 - Federal Government/Agency
21 - Consulting Firm (Engineering/Other)
25 - Wastewater Equipment/Material/Supplier

27 - Industry
28 - Construction Contractor
31 - Educational Institution
61 - Other (Please specify):

Education Code (1)

1 - Less than High School
2 - Training Courses, Short School
3 - High School
4 - Attended College
5 - Completed Junior College
6 - Bachelor's Degree
7 - Advanced Degree

Membership Categories

<input type="checkbox"/> Active For individuals involved or interested in the advancement of knowledge pertaining to water quality. Dues \$ <u>55.00</u> Journal Included Highlights Included Forum <input type="checkbox"/> \$12.50 TOTAL \$ _____	<input type="checkbox"/> Operations Division For individuals working on a day-to-day basis (or retired from) in a wastewater collection, treatment, or laboratory facility. Dues \$ <u>22.50</u> Journal <input type="checkbox"/> \$30.00 Highlights <input type="checkbox"/> \$15.00 Forum Included TOTAL \$ _____	<input type="checkbox"/> Student For individuals enrolled at least half-time in a college or university. Dues \$ <u>19.50</u> Journal Included Highlights Included Forum <input type="checkbox"/> \$12.50 TOTAL \$ _____	<input type="checkbox"/> Corporate For companies engaged in the design, construction, operation or management of water quality systems. Dues \$ <u>180.00</u> Journal Included Highlights Included Forum Included TOTAL \$ _____
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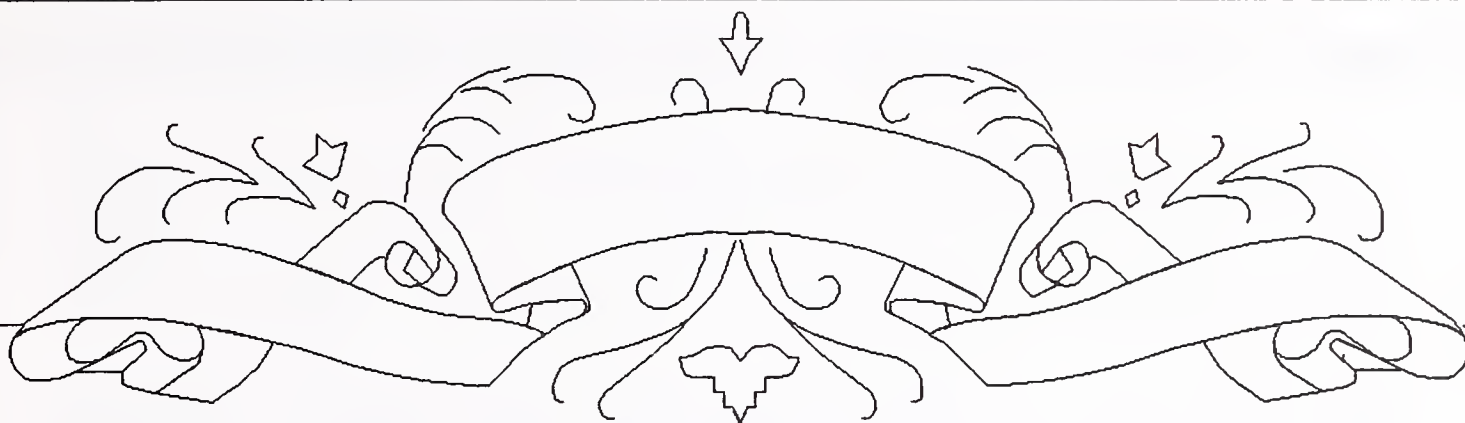
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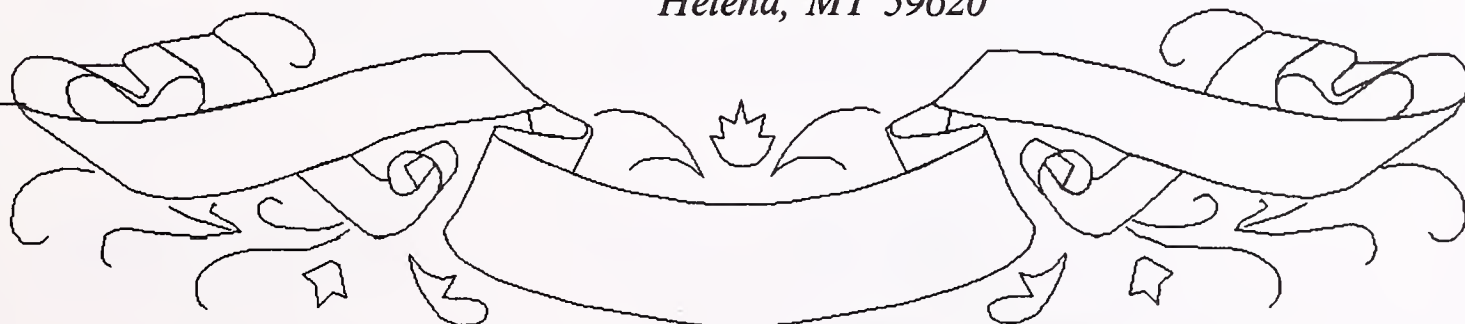
DEADLINES FOR BIG SKY CLEARWATER ARTICLES

The Big Sky Clearwater is a biannual publication for water and wastewater operators. The Clearwater is distributed to certified operators, Montana Section members of AWWA and WPCA, and other interested parties. Over 1600 copies were mailed for each issue last year.

Editors of the Clearwater are always interested in receiving articles of interest to the water and wastewater industry. If you have any ideas, information or handy tips you would like to pass on to others involved in the water and wastewater field, please contact the Water Quality Bureau about publication of your article in the Clearwater.

*Articles can be brief, or a few pages in length. They may consist of your own thoughts and ideas, your experiences, day-to-day operational tips, or technical subjects. Photos and diagrams are also welcome. **Articles to be published in the Big Sky Clearwater must be submitted for consideration prior to January 1 and July 1.***

*Submit articles to: Editor, Big Sky Clearwater
MDHES Water Quality Bureau
Cogswell Building - Room A206
Helena, MT 59620*



If you have any ideas or information that you would like to pass along to other people involved in the water and wastewater field, please don't hesitate to contact the office of the Water Quality Bureau. This publication welcomes articles of interest and random pieces of information regarding anything to do with water.

An article may consist of your own thoughts and ideas about something you may have experienced. Perhaps such information could help someone else in their day-to-day work. It could also be a technical article that is developed from research information and library resource material. If it has to do with water and you think it may be of interest, give us a call at the WQB: 444-2406.

If you do not wish to continue receiving this publication please send us your name and address so that we can remove your name from our mailing list.

Water Quality Bureau
Department of Health & Environmental Sciences
Cogswell Building
Helena, MT 59620

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